REPORT RESUMES

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OPERATION GIANTSTEP, RESEARCH IN A NEW REMEDIAL PROGRAM AND COMMUNITY COLLEGE INDUSTRIAL TECHNOLOGY CURRICULUM FOR DISADVANTAGED HIGH SCHOOL GRADUATES.

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A COMPREHENSIVE CURRICULUM STRUCTURE WAS FORMULATED AND SPECIFIC PREPARATORY STEPS OUTLINED FOR THE ORGANIZATION AND OPERATION OF AN EXPERIMENTAL JUNIOR-COLLEGE PROGRAM IN INDUSTRIAL TECHNOLOGY FOR DISADVANTAGED YOUTH. THIS PLANNING RESULTED IN THE DEVELOPMENT OF A PROPOSAL FOR A 5-YEAR, $1 MILLION EFFORT ON RESEARCH AND DEVELOPMENT OF TWO NEW POST-HIGH SCHOOL CURRICULUMS. THE FIRST CURRICULUM WAS A REMEDIAL PROGRAM DESIGNED TO PREPARE GENERAL DIPLOMA HIGH-SCHOOL GRADUATES WHO ARE INELIGIBLE FOR COLLEGE ADMISSION FOR THE SECOND CURRICULUM, A 2-YEAR VOCATIONAL PROGRAM IN INDUSTRIAL TECHNOLOGY. THE EXPERIMENTAL PLAN PROPOSED WAS FOR 100 EXPERIMENTAL STUDENTS AND 50 CONTROLS TO GO THROUGH AN INSTRUCTIONAL AND FOLLOWUP SEQUENCE WHERE THE CONTROL SUBJECTS WOULD ENTER THE INDUSTRIAL TECHNOLOGY CURRICULUM WITHOUT REMEDIAL TREATMENT. A COPY OF THE PROPOSAL, BR-7-0260 WHICH WAS SUBMITTED TO THE FEDERAL GOVERNMENT IN AUGUST 1966, WAS INCLUDED WITH THIS REPORT. (JH)

Final Report
Project No. 5-1336

ED012830

BRONX COMMUNITY COLLEGE
OF THE CITY UNIVERSITY OF NEW YORK

Title: OPERATION GIANTSTEP, Research in a new remedial program and community college Industrial Technology Curriculum for disadvantaged high school graduates.

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OE Number: ~~Office of Education Grant Number~~ ERD553, Vocational Education Act of 1963 PL 88-210 section 4(c).

Grantee Institution: Bronx Community College of the City University of New York, 120 East 184 Street, Bronx, New York 10468

Date of Report: October 30, 1966

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Supported by a Grant from the
U.S. Department of Health, Education, and Welfare
Office of Education
Bureau of Research
Division of Adult and Vocational Research

AA000190

SUMMARY

GRANT NUMBER: Office of Education Grant Number ERD553, Vocational Education Act of October,1963 P.L. 88-210 section 4(c)

TITLE: OPERATION GIANTSTEP: Research in a new remedial program and community college Industrial Technology Curriculum for disadvantaged high school graduates.

INVESTIGATORS: Manuel Stillerman and Milton Lowens

INSTITUTION: Bronx Community College of the City University of New York

DURATION: February 1, 1966 to September 30, 1966

Objectives

1. To study and formulate a comprehensive structure for the organization and operation of an experimental junior college level program in industrial technology for disadvantaged youths.

2. To secure expert consultative assistance from appropriate university and other sources to help in achieving the above.

3. To develop complete and fully-detailed plans for the curriculum, the operational procedures, and the research and evaluation activities of the experimental program.

4. To identify and make provision for the specific preparatory steps (including recruitment of students and staff, location of suitable space, layout and design of special laboratories, organization of library, tutorial center, and other special facilities) that will be required to bring the experimental program into operation.

Procedures

1. Assemble and organize a planning team, including the principal investigators, the project staff, and a group of expert consultants from appropriate university and other sources.

2. Develop a comprehensive structure and fully-detailed plans for the organization and operation of the experimental program.

3. Seek suitable financial support for carrying out the experimental program.

4. Make preparations, with the planning team as a nucleus, for bringing the experimental program into operation smoothly and promptly at the appropriate time.

Results and Conclusions

The results of this project are represented by the development of a proposal of the same title submitted to the Department of Health, Education, and Welfare on August 31, 1966. The proposal has been assigned number 7-0260 by the department.

A file of materials including organizational, research, and curricular details has been retained for use by the project staff should the proposal project be funded.

As a result of efforts under ERD553, the project staff has developed a program that they believe can pilot two curriculums and attempt research.

The first curriculum is a remedial program or vestibule designed to prepare general diploma high school graduates for the second curriculum in Industrial Technology. These curriculums are planned for presentation in modular units four weeks in length at the start and increasing to sixteen as the student progresses.

The research attempts to answer questions about the relative efficiency of vocationally and academically oriented remedial programs and also explores preparatory programs of two different lengths.

It was decided best to wait until the final project staff was assembled and a university based evaluation agency is under contract before final detailing. It is anticipated that this procedure would result in maximum coordination between the curricular, organizational and research aspects of the project. As a result of this reduction in effort, there was a concomitant reduction in expenditure.

Appendix to Final Report on Project No. 5-1336
(Grant No. OEG-1-6-000553-0803)

As a result of the work performed under Project No. 5-1336, the Bronx Community College developed a large-scale proposal for a five-year $1,000,000 effort on "research in a new remedial program and community college industrial technology curriculum for disadvantaged high school graduates."

The large-scale proposal was submitted to the U.S. Office of Education, Bureau of Research, where it was assigned the number 7-0260. A copy of Proposal No. 7-0260 is attached herewith as an appendix to the final report on Project No. 5-1336.

Attachment

SEP - 7 1966

7 0260

PROPOSAL FOR RESEARCH AND/OR RELATED ACTIVITIES SUBMITTED TO THE U.S. COMMISSIONER OF EDUCATION FOR SUPPORT THROUGH AUTHORIZATION OF THE BUREAU OF RESEARCH

Title: OPERATION GIANTSTEP: Research in a new remedial program and community college Industrial Technology Curriculum for disadvantaged high school graduates.

Cooperating Agency: Bronx Community College of the City University of New York, 120 East 184th Street, Bronx, New York 10468. Telephone - 212 933-7000.

Initiator: Manuel Stillerman
Manual Stillerman, Director, Evening and Extension Division, Bronx Community College. Telephone - 212 933-7000, Ext. 716.

Transmitted by: James A. Colston
James A. Colston, President, Bronx Community College.

Contracting Officer: Joseph Berman
Mr. Joseph Berman, Fiscal Officer, Bronx Community College.

Duration of Activity: February 1, 1967 to August 1972 (including one year follow-up).

Total Federal Funds Requested: $1,074,330

Date Transmitted: August 1966

OE Number Assigned: ERD-553:

ABSTRACT

TITLE: OPERATION GIANTSTEP: Research in a new remedial program and community college Industrial Technology Curriculum for disadvantaged high school graduates.
PRINCIPAL INVESTIGATOR: Manuel Stillerman
CONTRACTING AGENCY: The Bronx Community College of the City University of New York.
TOTAL FEDERAL FUNDS REQUESTED: $1,074,330.
BEGINNING AND ENDING DATES: February 1, 1967 to August 1972 (including one year follow-up).

Purposes

1. To discover, through research, information useful toward the development of effective pre-college remedial programs for general diploma high school graduates ineligible for college admission.

2. To develop, refine, and evaluate two new post-high-school programs.
   a. a remedial-preparatory program (Vestibule);
   b. a two-year community college vocational education curriculum in Industrial Technology designed to accommodate the needs and limitations of the target population.

Procedures

1. Operational: OPERATION GIANTSTEP consists of three partially overlapping phases:
   a. a tooling-up phase to recruit students and staff, acquire equipment, and set up laboratories;
   b. A Developmental Phase in which 100 students go through the entire instructional and follow-up sequence: i.e., a *preparatory program* (Vestibule); the *Industrial Technology Curriculum*; and *a one-year follow-up on the job*;
   c. an Experimental Phase in which 100 experimental students and 50 Controls go through the sequence (except that the Control students enter the Industrial Technology Curriculum without remedial treatment).
2. Research:
   a. two treatment variables will be investigated: *duration* and *instructional emphasis*;
   b. the dependent variables are defined as *success in the Industrial Technology Curriculum* and *success on the job*.
3. Dissemination: The results of the research and curriculum developments will be made available to the educational community.

Anticipated Contributions

1. To provide educational opportunities to help a deserving segment of deprived youth avoid relatively unproductive futures.
2. To help such youths overcome personal and environmental handicaps by succeeding in satisfying careers for which there is a local and national demand.
3. To discover and disseminate information which may lead to more effective remedial and college-level vocational programs for a segment of our youth presently suffering educational neglect.

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SECTION 1: PROBLEM

Summary

This section discusses problems involved in giving needed vocational training (at the community college level) to high school graduates who did not get vocational training in high school nor were prepared for college. Section 1 gives the background for the proposed research, explores why youth with socio-economic handicaps require the proposed program locally, and demonstrates that the outcomes may have national as well as regional implications. The structure of the training program reflects present curricular trends in vocational education.

Outline

A. Introduction

   1. General Statement of the Problem
   2. The Educational Program

      a. the vocational aspect
      b. the preparatory aspect
      c. implications for other curricular areas

   3. The Research Program

B. Need for New Vocational Education Programs at the Community College Level

   1. Definition of "Disadvantaged High School Graduate"
   2. High School Curricula and Disadvantaged Graduates
   3. Unemployment and the Disadvantaged High School Graduate
   4. Extrapolation of Available Data to Present
   5. Urgency of the Problem for Minority Youth
   6. Acknowledgment of the Need by the Board of Education

C. The Importance of Training Programs in Industrial Technology

   1. National Indications
   2. Regional and Local Indications

D. Benefits for Those Who Cannot Complete the Entire Program

   1. Early Improvement in Employability
   2. Wide Range of Job Skills Enhances Technological Adaptability

SECTION 1: PROBLEM

A. Introduction

1. General Statement of the Problem

OPERATION GIANTSTEP is concerned with the problems of a segment of our youth presently suffering educational neglect and socio-economic deprivation -- i.e., recent general-diploma high school graduates ineligible for college and not specially trained for desirable employment. There is a pressing social need to improve the work potential of these youths and to revive or encourage their pursuit of worthy and satisfying careers. The blights of poverty, ghetto environment, racial prejudice can be considerably offset by employment in careers that provide not only good wages but also pride of skill.

OPERATION GIANTSTEP addresses itself to two problems related to the needs of these youths: developing a post-high-school vocational educational program for them and carrying out research to help design programs capable of salvaging this great pool of undeveloped manpower.

Many youngsters of deprived socio-economic backgrounds are not being reached by existing educational resources. Even among those youths who have completed high school and are interested in further education, there are many unprepared to benefit from existing community college programs.

2. The Educational Program

What are the most effective ways of bringing disadvantaged youth (so often unemployed, frustrated, aimless, angry, but nevertheless capable of becoming one of our most valuable resources) into the main stream of our society as fully-participating, productive citizens?

One of the most widely accepted means of coping with this problem is to provide the youngster with the means of obtaining and holding a suitable job. In our present society this requires, among other things, vocational training.

a. The Vocational Aspect

The community colleges in New York City do not have programs suitable for the population this project intends to serve. This project will attempt to deal with general diploma high school graduates who are interested in engineering-related careers. Existing college-level Engineering Technology curricula, which include difficult courses like calculus and physics and an extensive amount of "liberal arts" subjects, are unsuitable for disadvantaged students. It is therefore proposed to develop a new Industrial Technology Curriculum.[1], [2]

b. The Preparatory or Remedial Aspect

Even with a less demanding curriculum, it is felt that the majority of the target population are not adequately prepared. A preparatory or remedial program will be developed. A number of successful preparatory programs have been in effect for some time, including those at Bronx Community College and Broome Technical Community College.[3] The project staff will draw on these and other experiences and also attempt to innovate and experiment toward a more effective and efficient remedial pattern.

c. Implications for Other Curricular Areas

The limitation in the scope of this project is deemed necessary to permit focus on the basic principles involved. The engineering-related area was chosen because there is known to be an adequate number of job opportunities, there will be a sizeable interested population, the Bronx

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[1] American Society for Engineering Education. "Characteristics of Excellence in Engineering Technology Education." Urbana, Ill.: The Society, 1962.

[2] Norman C. Harris, *Technical Education in the Junior College/New Programs for New Jobs,* American Association of Junior Colleges, Washington, D.C., 1964.

[3] State University of New York, Binghamton.

Community College is experienced and knowledgable in this area, and the training demands though challenging are capable of being handled by motivated students. Although it will be necessary to use caution in extrapolating the results of this project toward implications for other curricular areas, it is hoped that the results offered here will provide a sounder base for similar developments in other areas.

3. The Research Program

A great many projects, ranging in size from large Job Corps Camps to modest Community Action Programs, have been set up to cope with the vexing problem considered here. According to the panel that reviewed the original OPERATION GIANTSTEP proposal dated May 20, 1966: "Numerous efforts have already been made pertaining to experience at the junior college level for disadvantaged youngsters. These previous efforts [have provided] the answer that given a group of disadvantaged youngsters with modest high school backgrounds and support and assistance at the junior college level, most of them seem to succeed in the prescribed program of studies."[1]

The review panel suggests, therefore, that instead of demonstrating "what is already known," it would be more useful to determine the factors in a remedial program that are most likely to help students succeed: ["Design the proposal] in such a way as to determine exactly what accounts for the success. This is the next step needed, rather than demonstrate again what is already known."[2] Such information would have both regional and national implications.

Most remedial programs try to cope with the problems of idle youth who have dropped out of high school prior to graduation. Comparatively little has been done to assist the smaller but at least equally deserving group of high school graduates who lack both adequate technical training needed for employment or qualification for entrance to a junior college where they might hope to receive such training. OPERATION GIANTSTEP seeks information that will lead to the development of more effective preparatory programs[3] to serve as a "bridge" by which high school graduates, previously excluded, could gain entrance to and succeed in a two-year technical, career-oriented community college curriculum specially structured to meet their abilities and needs.

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[1] From General Recommendations of Review Panel accompanying letter dated August 16, 1965 from David S. Bushnell, Director, Division of Adult and Vocational Research of the U.S. Office of Education.

[2] *Ibid.*

[3] *Ibid.*

Remedial instruction, per se, is not the purpose of the proposed preparatory programs. It is, rather, to take idle youth away from the hopelessness of the streets, to bring them back to the educational fold, to have them discover that learning is possible, that it can be "fun," and that it can pay off ultimately in more satisfying work and a better economic life. The programs are intended to inspire, to motivate, to increase the aspiration and sense of personal worth of the participants.

B. Need for New Vocational Education Programs at the Community College Level

The proposed program is planned for those who *want, need,* and can *profit from* vocational training:

Want - as indicated by interest in the program and willingness to devote the time required.

Need - as indicated, suspected, or demonstrated by inability to obtain satisfactory employment without it.

Profit from - as indicated by the resulting ability to obtain, hold, and grow in jobs related to such training.

This subsection explains why the potential student participants in this post-high-school project are unable to get vocational training at the high school level.

1. Definition of "Disadvantaged High School Graduate"

OPERATION GIANTSTEP defines a "disadvantaged high school graduate" as:

a. impoverished, culturally and educationally deprived, frequently a victim of prejudice resulting from ethnic differences; usually a Negro, Puerto Rican, or a member of some other easily identified minority; and

b. a product of a *"dead-end"* high school curriculum leading neither to college nor to work.[1]

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[1] So characterized by James E. Simmon, Former Deputy Director, "Upward Bound Project," U.S. Office of Economic Opportunity, in an address to the *"Upward Bound Workshop,"* sponsored by the State Education Department in Albany, N.Y., March 18, 1966.

2. High School Curricula and Disadvantaged Graduates

To understand the second definition it is necessary to consider briefly the present organization of the eighty-nine public high schools of the City of New York, which are divided into two different systems: sixty "academic" and twenty-nine "vocational" high schools. The type of high school which a student enters depends upon a number of factors including parental and student preference, counselors' recommendations, previous school performance, his vocational objectives, admission tests, and the like. Once a student is admitted to one type of high school, transfer to another is difficult because of differences in the curricula and objectives.

The kinds of curricula and objectives of the two types of high schools is shown in TABLE I, page 1-6. TABLE I also shows the distribution of male students in these schools and courses in 1963, 1964, and 1965.

The *academic* course prepares the student for college.[1] The *commercial* and *vocational* courses tend to be terminal in nature; they seek to prepare the student for work in commercial or clerical occupations, or in a variety of skilled crafts or trades. The *technical* courses offered by some academic and vocational high schools may be either terminal or college-preparatory in nature. If terminal, the student is prepared to begin work as an apprentice technician.

In contrast, the objectives of the *general* course cannot be stated so readily. "It is not to prepare the student for college nor to give him a specific type of [job-preparatory] training."[2]

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[1] A statement to this effect appears on the application blank which junior high school students use in applying for admission to senior high schools.

[2] Frederick Shaw, "A Follow-Up Study of the 1963 High School Graduates in New York City Schools." Board of Education. Bureau of Educational Programs Research, Publication No. 237, January 1965, p. 13.

TABLE I

MALE GRADUATES OF ALL NEW YORK CITY HIGH SCHOOLS RECEIVING VARIOUS TYPES OF DIPLOMAS[1]

Type of High School	Kind of Diploma	Date Awarded June 1963 Number	 %	 June 1964 Number	 %	 June 1965 Number	 %
Academic (60 Schools)	Academic	10,380	50.9	11,670	48.4	10,370	44.4
	Commercial	220	1.0	410	1.7	320	1.4
	General	5,810	28.5	7,210	30.0	7,880	33.8
	Technical	1,000	4.9	1,270	5.3	1,220	5.2
Vocational (29 Schools)	Vocational	2,670	13.2	3,160	13.1	3,210	13.8
	Technical	150	.7	210	0.9	180	0.8
	Commercial	140	.7	120	0.5	140	0.6
	Other	10	-	20	0.1	-	-
All 89 H.S.	TOTAL	20,470	100	24,070	100	23,320	100

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[1] Figures rounded. Data from Board of Education of the City of New York (Bureau of Educational Program Research and Statistics).

There is a growing trend towards "comprehensive" high schools which will hopefully ease the problem of transferring from one curriculum to another. However, most of the public and private schools of the country still offer the traditional college preparatory courses with second or third track "modified" or "life adjustment" courses for students with lower apparent academic potential. These secondary tracks correspond to the "general" courses in New York City. Graduates of such curricula are "disadvantaged" in that they lack adequate preparation for either employment or further education.

3. Unemployment and the Disadvantaged High School Graduate

Since all high school curricula except the general are designed to lead to preparation for college or for work, it is not surprising to find in TABLE II (below) that the rate of unemployment of graduates of the general course is highest.

TABLE II

POST HIGH SCHOOL ACTIVITIES (FALL 1963) OF MALE GRADUATES OF ALL NEW YORK CITY HIGH SCHOOLS ACCORDING TO DIPLOMAS EXPECTED IN JUNE AND AUGUST 1963[1]

				POST HIGH SCHOOL GRADUATION ACTIVITY - FALL 1963										
KIND OF DIPLOMA	NUMBER RECEIVING DIPLOMAS 7/63 & 8/63	RESPONSES TO QUESTIONNAIRES		ATTENDING SCHOOL				IN ARMED FORCES		IN LABOR FORCE				
				FULL TIME		PART TIME				EMPLOYED		UNEMPLOYED		RATE OF UNEMPLOY'T.
		NUMBER	%	NUMBER	%	NUMBER	%	NUMBER	%	NUMBER Ⓐ	%	NUMBER Ⓑ	%	$\frac{Ⓑ}{Ⓐ+Ⓑ}$
ACADEMIC	10,574	9,648	91	8,539	88	749	8	92	1	215	2.2	53	0.5	19.8%
COMMERCIAL	236	191	81	62	32	60	31	13	7	52	27	4	2	7.1%
GENERAL	6,613	3,656	55	997	27	760	21	391	11	1,124	31	384	11	25.5%
TECHNICAL	1,084	637	58	560	88	51	8	10	2	13	2	3	0.5	18.7%
VOC. & TECH.	3,750	3,372	90	573	17	98	3	509	15	2,042	61	248	7	10.5%

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[1] *Ibid.*, pp. 14, 15, 19.

TABLE II shows that the unemployment rate[1] of male general course graduates is highest (25.5%). It is also important to note that there are only 268 Academic, 56 Commercial, and 16 Technical, as compared with 1,508 General Graduates.[2]

High as it is, the 25% unemployment rate among general course graduates may actually be much greater. The data was obtained from responses to post-card questionnaires. Analysis of answers to such questionnaires often reveals that those who can offer socially acceptable replies are more likely to respond than those whose replies indicate failure, unemployment, or the like. This may explain the poor rate of response from the general course graduates (55% as compared with 91% for the academic).

4. Extrapolation of Available Data to the Present

No available study of post high school graduation activity has been made in New York City since Shaws' in 1963 but there is no reason to believe that the data would be significantly different today. The shrinking demands for untrained employees should, if anything, impinge more on the General Diploma graduate.

5. Urgency of the Problem for Minority Youth

A large proportion of students enrolled in the general course of the academic high schools consists of "disadvantaged" Negroes and Puerto Ricans. There are no statistics available to demonstrate this but it is a matter of common knowledge among the personnel of the high schools, readily verified by observation. TABLE III provides an indirect indication. The high rate of unemployment among the youth of these minority groups is a matter of nation-wide concern; the Shaw study cited here indicates a rate of unemployment in excess of 25%. But this is an average figure, taken for the entire city. Since it includes students from other ethnic groups whose rate of unemployment usually is lower, the rate of unemployment among Negro and Puerto Rican graduates with general diplomas may be assumed to be higher.

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[1] Computed by using the Bureau of Labor Statistics formula: $\text{Unemployment Rate} = \frac{\text{Number of Unemployed}}{\text{Number in Labor Force}}$

[2] Over 88% of academic course graduates continue their education full time, and more than 8% part time. For the small number of academic course graduates who do not attend school and who are available for work (268), the task of finding employment is not easy, since (like the general course graduate) they were given no specific job-preparatory training. Hence 53 of the 268 are unemployed (19.8%). The total number of cases (3) among the technical course graduates is too small to be significant.

TABLE III

PERCENTAGE OF GRADUATES OF SELECTED HIGH SCHOOLS RECEIVING DIPLOMAS IN JUNE 1965[1]

Schools Serving Deprived Areas With High Percentages of Negro and Puerto Rican Students		Schools Serving Privileged Areas With Smaller Percentages of Negro and Puerto Rican Students	
Name of School	Percent General Diplomas	Name of School	Percent General Diplomas
Morris	83	Bayside	27
Franklin	88	Forest Hills	28
Boys	80	Francis Lewis	31

Shaw states in his final summary:

> . . . The most serious problem of joblessness showed up among academic high school graduates with general diplomas, whose unemployment levels far exceed the national rates. This may be regarded as a danger signal. The general level of skills needed for the most rewarding occupations is rising, but [these are not now open] to holders of general diplomas. Indeed many who earn these diplomas attain relatively low levels of academic achievement.[2]

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[1] Derived from Report on Graduates - June 1965. Board of Education of the City of New York. High School Division Circular No. 89, 1964-65.

[2] Shaw, p. 46.

The ever-swelling pool of unemployed out-of-school youth in our city is the "social dynamite" in Conant's oft-quoted statement: "Social dynamite is building up in our large cities."[1]

6. Acknowledgment of the Need by the Board of Education

The need to provide general course students with presently unavailable opportunities for post-high school vocational or technical education is acknowledged by the New York City Board of Education:

> The skills, knowledge and technology now required go further than those previously needed as the minimum basis for employment in the metropolitan area. These packages of skills require training in and beyond high school. Many potentially able students are unable during their high school years to reveal their potential to a degree sufficient to insure their college admission [under existing admission requirements]. . . . *It is imperative that the community colleges develop plans to identify and then admit students with unrealized potential.* . . . The community college can provide a proving ground for youth with heretofore undemonstrable talents.[2] [Italics added.]

C. The Importance of Training Programs in Industrial Technology

The need to develop Industrial Technology Curriculums has been recognized nationally and locally.

1. National Indications

TABLE IV, page 1-11, compares past and projected future national distribution of the labor force in various major occupational groups. There is a 6.2% anticipated *increase* for "Professional, technical, and kindred workers" as compared with a 0.4% decrease for "skilled or semi-skilled workers." The latter is perhaps the job classification to which large numbers of disadvantaged youth could readily aspire. "Service workers" show a moderate increase (2.5%) and unskilled workers decline the most (2.6% decrease). A dramatic shift in the future distribution of the labor force is indicated. In 1940, the top and bottom groups were practically equal (8% and 7%). In 1975 the proportions will be in the ratio of more than 3 to 1 (14.2% and 4.4%).

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[1] James B. Conant, *Slums and Suburbs* (N.Y., McGraw Hill, 1961), p. 146.

[2] Board of Education (NYC), Office of Curriculum Research and Evaluation. Brochure: *A New Correlated Curriculum for General Education in the High Schools*. September 20, 1965, p. 2 (mimeographed).

TABLE IV

DISTRIBUTION OF THE LABOR FORCE IN VARIOUS MAJOR OCCUPATIONAL GROUPS (UNITED STATES, 1940-1975)[1]

Major Occupation Group	Rounded Percents		Change
	1940	1975	
Professional, Technical and Kindred	8.0	14.2	+ 6.2
Managers, Officials, Proprietors, Except Farm	8.1	9.6	+ 1.5
Clericals and Sales Workers	16.7	22.9	+ 6.2
Skilled and Semi-Skilled Workers	29.7	29.3	- 0.4
Farmers, Farm Managers, Foreman and Laborers	18.5	4.6	- 13.9
Service Workers	11.9	14.4	+ 2.5
Unskilled Workers, Except Farm and Mine	7.0	4.4	- 2.6

The importance of training "industrial technicians" is further emphasized by a 1961 study which concluded that by 1970 the national need for technicians in *industry alone* would exceed 1,262,000 as compared with 630,000 employed in

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[1] Harris, p. 26.

1960[1]. Evidently the supply must be doubled in a decade. As Harris says:

> Allowing for deaths and retirements as well as for *new* demands, almost 68,000 new technicians would have to be educated and trained each year to meet the 1970 estimated demand. It is doubtful that the current annual rate of production of technicians from all sources (junior colleges, technical institutes, industry training programs, and armed services schools) exceed 35,000. . . .[2]

There is clearly need for expansion of training opportunities for potential technicians. These figures do not include "non-industry" jobs in government, education, and health, areas which in 1960 employed another 240,000 technicians. There is little doubt that this number will also double by 1970. To fulfill these needs, the vast pool of wasted youth from the deprived segments of our population must be tapped and utilized for their own and society's advantage.

Finally, the national labor force in the 1960's is likely to be 20% greater than it was in the 1950's, and it will have a higher percentage of young persons (18 to 25) than ever before in our history.[3]

From the preceding statistics, it seems reasonable to conclude that even if anti-poverty efforts significantly reduce the numbers of disadvantaged youth, the projected overall increase in the population of young people will leave the number of disadvantaged young men relatively high. The substantially constant number of job openings in some occupational areas, and the shrinking number in others for which disadvantaged high school graduates may qualify without further training, suggests the probability of a continuing high level of unemployment among this group unless upward mobility is provided to occupational areas of increasing demand. In the decade 1960-1970, the numbers of professional, semi-professional, and technical workers will increase 40%; and while the overall standard of living rises, the demand for unskilled labor will fall off markedly.[1]

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[1] National Science Foundation and U.S. Department of Labor, Bureau of Labor Statistics. *The Long-Range Demand for Scientific and Technical Personnel.* Bulletin NSF61-65. Washington, D.C. Government Printing Office, 1961.

[2] Harris, p. 28.

[3] U.S. Department of Labor, *Manpower: Challenge of the 1960's.* Washington, D.C., Government Printing Office, 1961.

a. Conformity of Proposal with Present Curricular Trends

In its earlier days vocational-industrial training tended to be sharply aimed at specific crafts or skills such as electric wireman, machinist, or auto mechanic. With the advance of technology, particularly in the fields of numerical control and automation, training in narrow specialties no longer provides the trainee with the adaptability needed to meet unexpected developments. Accordingly, the present trend is towards training in broad technological areas. As Bushnell says: "[There is now] a recognition that many occupations can be clustered so that the student is cross-trained in a number of related fields."[2]

The curriculum of OPERATION GIANTSTEP has been organized to provide such cross-trainings. As indicated in detail in Section 5-D, the student first explores three broad areas of technology (electrical, electronic, and mechanical) and then receives increasingly intensive training in each. These specialties are included in the job clusters which have been identified by the U.S. Department of Labor as promising "rapid growth in employment opportunities in the near future."[3]

2. Regional and Local Indications

The pressing need for training of technicians on a local basis is indicated in TABLE V, page 1-14. Comparable data are not available for New Jersey, but it is reasonable to assume that this highly industrialized region would have similar employment opportunities for technicians.

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[1] *Ibid.*

[2] David S. Bushnell, "Curriculum Development: A Major Research Challenge," *American Vocational Journal*, May 1966, p. 34.

[3] *Ibid.*

TABLE V

NUMBER OF JOBS IN ALL TECHNICAL OCCUPATIONS IN SELECTED AREAS OF NEW YORK STATE ACTUAL 1962 AND PROJECTED 1970 AND 1975[1]

Region	Number of Jobs			Percent Charge			Percent of Jobs in State		
	1962	1970	1975	1962 1970	1970 1975	1962 1975	1962	1970	1975
Entire State	148,684	192,994	227,551	29.8	17.9	53.0	100.0	100.0	100.0
New York City	62,739	78,929	91,279	25.8	15.6	45.5	42.2	20.9	40.1
Nassau, Suffolk	22,835	29,964	35,987	31.2	20.1	57.6	15.3	15.5	15.8
Westchester	5,749	7,986	9,771	38.9	22.4	70.0	3.9	4.1	4.3
*Metropolitan Region	91,323	116,789	137,037	28.0	18.2	50.0	61.4	59.5	60.2

*Totals of New York City, Nassau-Suffolk, and Westchester counties, but not including nearby New Jersey areas.

These predictions of job growth involve a composite of many technical occupational titles. Some of these are expected to show greater percentage changes than others for the same period. The occupation title "industrial technician," while not specifically listed as such in the New York State Study quoted below, has a probable growth potential no lower than the above composite.

The data in TABLE V indicates that both on a regional (New York State) and local (New York City metropolitan area) basis, the probable growth of job opportunities for technicians is highly favorable. According to a comprehensive study of Technical Manpower by the New York State Department of Labor, the projected growth of all major technical occupations (excluding engineers, scientists, and similar fully professional occupations included in the

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[1] New York State, Department of Labor, Division of Research and Statistics, *Technical Manpower in New York State*, Special Bulletin 239, Volume I, December 1964, pp. 24, 28-30.

U.S. Department of Labor data cited in TABLE V above) is 53% between 1962 and 1975. The study also states:

> It is estimated that private industry and government in New York State will provide a total of 193,000 jobs in technical occupations in 1970 and 227,600 in 1975 compared with 148,700 in 1962.[1]

The statistics and authorities quoted in Section C above indicate an urgent need for industrial technicians now and in the future. There is, therefore, compelling justification for establishing training programs, especially since such programs may enable industry to tap the vast pool of unrealized potential in disadvantaged youth.

OPERATION GIANTSTEP seeks effective designs for such programs and for the special preparatory programs needed to make disadvantaged youths eligible for them.

D. Benefits for Participants -- Including Those Who Cannot Complete the Entire Program

1. Early Improvement in Employability

As described in Section 5-C, students for the training program will be selected according to criteria and using statistical procedures which will assure a random sample of disadvantaged students who, though high school graduates, cannot meet the present requirements for commuity college entrance to existing technical curricula such as Engineering Technology. It is believed that most will fall within the third quartile of academic ability according to their high school records. Accordingly, because of their apparent low potential, it would be unreasonable to expect that all admitted to the program would be able to complete the requirements for the two-year A.A.S. degree. For this reason the training program is structured so that the trainee acquires basic marketable skills from the very first. (The practical nature of the OPERATION GIANTSTEP curriculum, with its self-evident "dollars and cents" value, is likely to encourage student retention in the program.) Thus for the student who completes only part of the program, marketable skills are provided.

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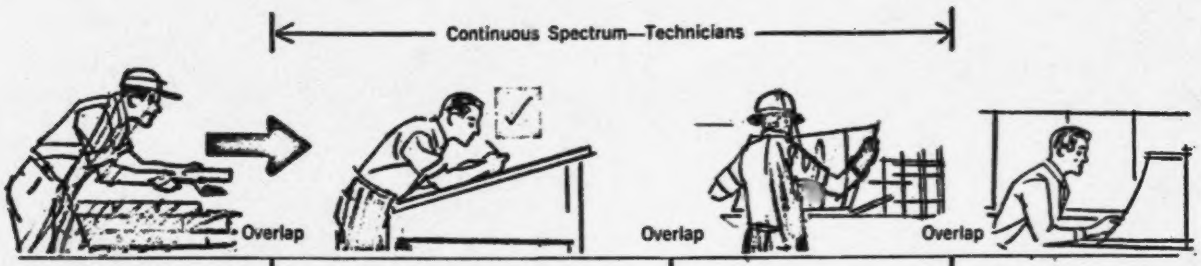
[1] New York State, Department of Labor, Division of Research and Statistics, p. 1, Supplement B (Job Projections in Technical Occupations), p. 2, December 1964.

2. Wide Range of Job Skills Enhances Technological Adaptability

The work of the Industrial Technician lends itself to progressive instruction at the semi-skilled, skilled, and technician levels. CHART I shows a distinct overlap in the functions of the Craftsman and the Industrial Technician. Thus instruction can start with manual skills needed for production jobs and move on to the technical knowledge required for advancement to the higher occupational level.

CHART I

THE SPECTRUM OF TECHNICAL JOBS



Craftsmen and Skilled Tradesmen	Highly Skilled (Industrial) Technicians ✓	Semiprofessional (Engineering) Technicians	Professionals—Engineers and Scientists
Production jobs requiring manual skills of a high order. Occasional need for technical knowledge. Repair, maintenance, and construction jobs.	Test, maintenance, and prototype production. Drafting, detailing, checking, estimating. Manual skills required, but technical knowledge essential also. Use of instruments and gathering of data under supervision.	Research and design activities in support of engineers and scientists. May work individually. Some manual skills, but major emphasis is on technical knowledge.	Basic research and design. Direction of research and production activities. Emphasis is on knowledge, not skills. Working at the "frontier" of knowledge.

Proposed Training Program starts at Tradesman Level and gradually moves into adjacent Industrial Technology Level.

Toward increased complexity and intellectual content of the job demands ⇒

Adapted from: [redacted]
Norman C. [redacted], Technical Education in the Junior College/New Programs for New Jobs. American Association of Junior Colleges, Washington, D.C. 1964. Used with permission.

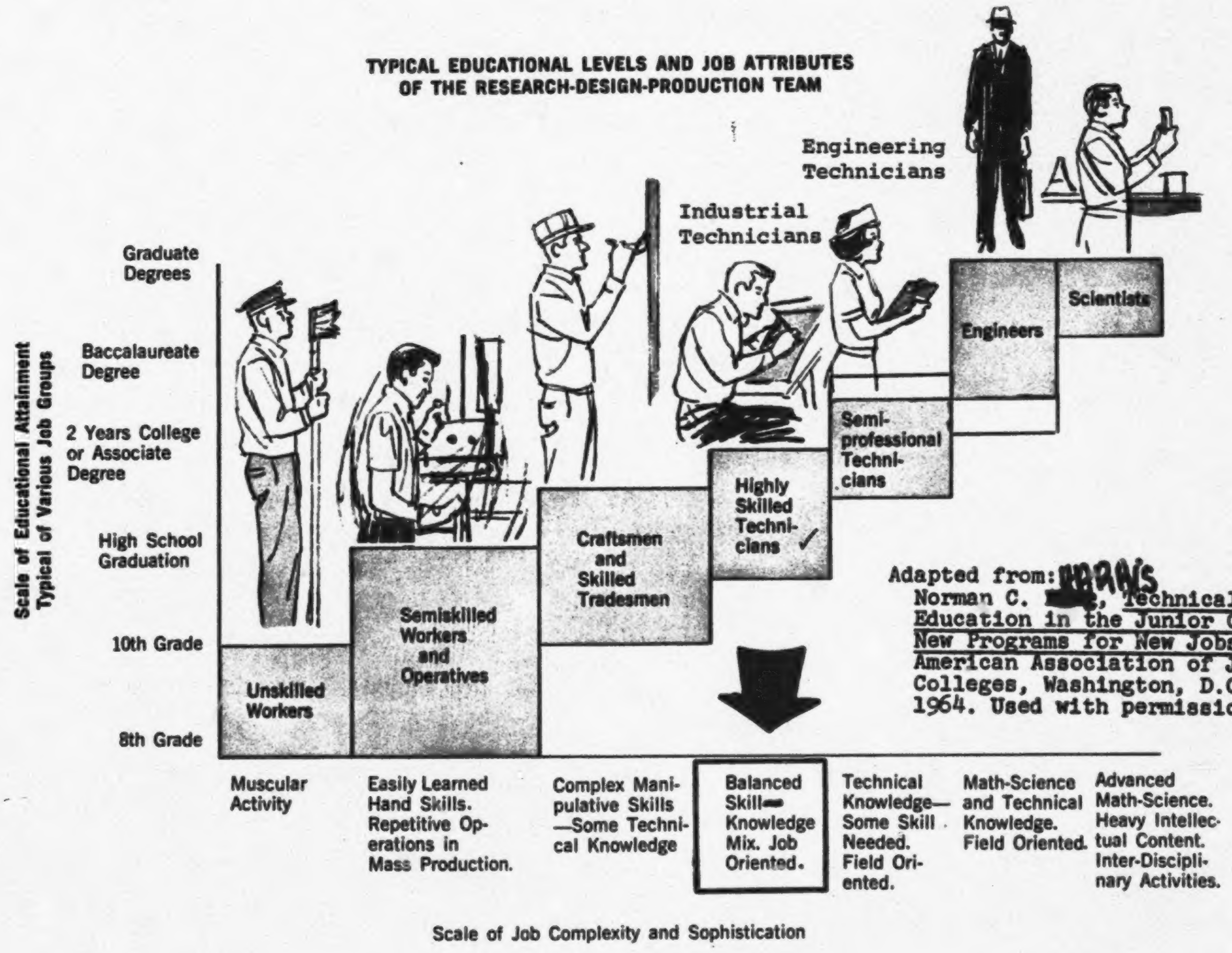
CHART I - RELATIVE LEVELS OF TECHNICAL OCCUPATIONS

CHART II, a scale of Job Complexity and Sophistication, shows the progression of skills to be acquired in moving from the lowest occupational level (unskilled) to the median level of the "Highly Skilled Technician." (The latter is another designation for Industrial Technician). The Industrial Technician is further characterized by the following quotation from a Harvard study:

> The Industrial Technician is one who does not require an extensive knowledge of science and engineering in depth to perform his work [as does an *engineering technician*]. When an

> industrial technician is working he uses more craft and manipulative skills than he does engineering knowledge.
>
> Some technical occupations are very limited in scope and level. In this group may be found such jobs as product inspection . . . or routine engine testing. . . . Such jobs are clearly not far from [those] of the craft worker, but are differentiated by the necessity for the technician to apply *some* science and engineering knowledge. . . .[1]

CHART II


TYPICAL EDUCATIONAL LEVELS AND JOB ATTRIBUTES
OF THE RESEARCH-DESIGN-PRODUCTION TEAM
Engineering Technicians
Industrial Technicians
Scale of Educational Attainment Typical of Various Job Groups
Graduate Degrees
Baccalaureate Degree
2 Years College or Associate Degree
High School Graduation
10th Grade
8th Grade
Unskilled Workers
Semiskilled Workers and Operatives
Craftsmen and Skilled Tradesmen
Highly Skilled Techni-cians ✓
Semi-professional Techni-cians
Engineers
Scientists
Muscular Activity
Easily Learned Hand Skills. Repetitive Operations in Mass Production.
Complex Manipulative Skills —Some Technical Knowledge
Balanced Skill—Knowledge Mix. Job Oriented.
Technical Knowledge— Some Skill Needed. Field Oriented.
Math-Science and Technical Knowledge. Field Oriented.
Advanced Math-Science. Heavy Intellectual Content. Inter-Disciplinary Activities.
Scale of Job Complexity and Sophistication

Adapted from: HARRIS
Norman C. [redacted], *Technical Education in the Junior College/ New Programs for New Jobs*. American Association of Junior Colleges, Washington, D.C. 1964. Used with permission.

CHART II - INDUSTRIAL TECHNICIANS

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[1] Harvard University, Graduate School of Business Administration, *Managing Technician Manpower*. A Report to Industry, Cambridge, Mass: The University, 1959.

Industrial Technology fits into a continuum of engineering related careers. The preceding section described how the student who leaves before completion will have received training toward some less demanding occupations.

On the other hand, for those who demonstrate the capacity to continue beyond Industrial Technology, avenues of upward mobility exist at Bronx Community College to higher level curricula such as Engineering Technology and even pre-Engineering.

SECTION 2: DESCRIPTION

Summary

Section 2 describes how OPERATION GIANTSTEP differs from other programs in vocational education and what it may accomplish that is not already in practice. It discusses the philosophy underlying the planned instructional emphases, describes some of the innovative elements, and cites previous works to establish a rationale for the proposed project.

Outline

Introduction

A. The Preparatory Vestibules

B. Justification for Motivational Aims of Vestibules

C. Improving the Attitudinal Set

  1. Reinforcement of Success
  2. Promise of Future Rewards
  3. Status
  4. Self-Examination

D. Instructional Methods

E. Comparison with Other Programs

  1. Serving the "Average" not the "Best"
  2. Avoidance of "Crash" Programs
  3. Contribution to Vocational Education
  4. Stress on Innovation

F. Instructional Emphases, Philosophy, and Rationale

  1. Key Questions
  2. Answers to Key Questions

SECTION 2: DESCRIPTION

OPERATION GIANTSTEP is organized into three phases of student experience:

1. A "Vestibule" will prepare disadvantaged high school graduates, previously excluded, for a special two-year community college Industrial Technology Curriculum. The primary research effort of this project will be concerned with this phase. The Experiment, which is described in Section 5, will seek to determine the relationship between certain treatment variables and dependent variables, defined as (or related to) success.

2. A special two-year community college Industrial Technology Curriculum leading to an Associate in Applied Science degree will then be offered. This phase will be the vehicle for evaluating the effectiveness of Vestibule training and will provide data needed to answer the research questions. In its own right it will represent a new, needed, curriculum in New York City. One of the secondary purposes of this project is to evaluate the effectiveness of this curriculum.

3. Post-college employment as technicians in jobs related to their training will hopefully follow for the participants. This will be a data gathering phase primarily.

OPERATION GIANTSTEP is divided into a Developmental Phase and an Experimental Phase. The Developmental Phase precedes the Experimental Phase and will be used to stabilize and adjust the Vestibule Program and Industrial Technology Curriculum. During the Developmental Phase control of variables, selection and development of instruments, and refinement of the curriculum will be accomplished. A trial of the data gathering and processing procedures will also be possible.

Besides the research effort (discussed in Section 5), the project will also serve to "Pilot" two programs (the Vestibule and the Industrial Technology Curriculum) urgently needed in New York City community colleges. A detailed description of the final form of these programs along with recommendations resulting from the research efforts will be useful to the Bronx Community College and others.

A. The Preparatory Vestibules

The educational aims of the Vestibules include an attempt to remediate the inadequate preparation of the students for community college technical training. Vestibule training will also provide students with some saleable skills in the process. These aims complement and support one another. In addition, features of the program will attempt to improve attitudes.

The Project staff feels that the Vestibules have features (see Section 5D) that will make them effective; for example, the use of short units of instruction (modules);[1] shop-centered instruction;[2] and emphasis on positive attitudes.

Vestibule training will be given to four groups of students. Each will receive a different pattern of instruction for purposes of the research. However, each pattern will contain the same elements of treatment. It is the amounts of certain elements which will be varied.[3]

Positive effects of the Vestibule on the attitudes of the students is considered to be of prime interest. Improving students' attitudes is an intermediate step toward success in college and on the job, and in a sense is an element of success itself. It is hoped that the program will:

a. promote *self-confidence* and an improved *self-image* so that attending college will no longer be a marginally practical idea;[4]

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[1] Dalton Plan and successful practices of preparatory schools.

[2] Richmond Plan and Board of Education Pre-Technology Program.

[3] For further details of the structure and content of Vestibules, see Section 5A-7.

[4] The importance of this aim for disadvantaged students has been emphasized in successful Pilot Programs with similar objectives. "Pre-college preparatory programs designed to generate the skills and motivation necessary for college success among young people from low income backgrounds and inadequate secondary school preparation." *Guidelines*, Upward Bound, U.S. Office of Economic Opportunity, Washington, D.C., December 1965, p. 1.

b. encourage higher *aspiration* and a determination to "stay with it" despite distractions or discouragement;

c. stimulate a *will to succeed* through better jobs and a better life;

d. synthesize these and other factors to create effective *motivation* to study and learn.

B. Justification for Motivational Aims of Vestibules

"Perhaps the most serious characteristic of the deprived child is his feeling of inadequacy. He devalues himself. He comes into school feeling that accomplishment and success are impossible for him."[1]

The young men OPERATION GIANTSTEP seeks to help are graduates of a "modified curriculum," the general course. These students know they have not been prepared for college, and recognize the implication of cues (such as lack of exposure to state-wide "regents" examinations) which mark them as inferior.

A proportion of all groups must be relatively less able. Even for many who are superior, it may be difficult to adjust to college. "Experience indicates beyond question that the least common denominator among disadvantaged children is poverty."[2] And, according to the U.S. Office of Economic Opportunity, "Poverty [alone] can so condition a young person's attitude . . . that . . . success in education just doesn't seem worth the try."[3]

C. Improving the Attitudinal Set

OPERATION GIANTSTEP is concerned with the relatively stable students who heeded the admonition (oft repeated through mass media) to "stay in high school and graduate." Further, the fact that they apply to this program shows ambition, or an understanding of the poor employment opportunities presently available to them. A much less severe attitudinal maladjustment than for the dropout is indicated. Nevertheless, efforts to help such youths are deemed to be specially important.

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[1] Joseph O. Loretan and Shelly Umans; *Teaching the Disadvantaged,* Teachers College Press, Columbia University, N.Y., 1966.

[2] Charles M. Shapp, "The Disadvantaged Child: Insights and Issues." Reprint of Address, New York State Association for Supervision and Curriculum Development, December 1963.

[3] *Guidelines,* Introduction.

1. Reinforcement of Success. Especially at the start, modules will be geared to the group's ability. The emphasis will be on tasks that are easy but satisfying. The rate of remediation will be kept secondary to the goal of positive reinforcement.

2. Promise of Future Rewards. The vocational aspects of the Vestibules will offer easily understood paths to future employment. Instructors, outside speakers, together with visits to industry, will all project an encouraging vocational future.

3. Status. Being a college student will provide status. Organized sports and participation in college-wide extra curricular activities will help.

4. Self-Examination. Group counseling techniques will be used to foster a student's better understanding of himself and help develop a comfortable relationship with the responsibilities and opportunities around him.

D. Instructional Methods

Instructional methods will be different from those he has experienced as a general student. Usual college approaches with lectures and self-study are not practical either.

The teaching format, four-week modules, will be a departure. It will provide more easily handled units of work and opportunities for major reinforcement. A major difference is that modules will be job-oriented or job-related. (Participation by the students in planning the lessons and methods of learning and study will be explored.) Programed instructional techniques will be used by instructors for groups and individual use.[1]

E. Comparison with Other Programs

"Upward Bound" programs of the U.S. Office of Economic Opportunity seek to help promising high school graduates with limited backgrounds make the transition to college by means of a "crash-type" remedial summer program often followed by conditional admission to regular liberal arts college classes.[1] No evaluation is yet available. Except for the on-campus residence provided by these "Upward Bound" projects, they appear to be very much like New York City's "College Discovery Program," which has similar objectives and organization, including the focus on liberal arts rather than on career programs.[2] (Bronx Community College, which is making the present proposal, pioneered in the "College Discovery Program."[3])

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[1] See Section 5D.

The following are the main differences between OPERATION GIANTSTEP and "similar" programs under "Upward Bound" and "College Discovery."

1. Serving the "Average" not the "Best"

Unlike the others, OPERATION GIANTSTEP does not propose to use highly selective procedures to disclose "promising students" so as to enroll only those most likely to succeed. Instead OPERATION GIANTSTEP will accept as many as can be accomodated from a pool of those who meet minimum standards of eligibility. There will be a random selection from the pool of acceptable applicants so as to ensure a representative sample of the target population. The underlying philosophy is to develop a program which will be useful for the average disadvantaged student, not the best.

2. Avoidance of "Crash" Programs

OPERATION GIANTSTEP does not propose to use crash programs. The project planners feel that such an approach may be more discouraging than motivating. An important weakness of disadvantaged students is lack of proper work habits and attitudes towards study. These are more readily developed gradually.[1]

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[1] At University of Oregon (75 students) and Florida A&M College, Talahasee (150 students). (The small number of these programs is apparently the result of policy.) "Upward Bound" students are primarily 10th and 11th graders. . . . " Special Report on Federal Programs, American Council on Education, Vol. IV, No. 3, May 1966.

[2] Rachel D. Wilkinson, "Discovery in the Bronx," *Junior College Journal*, Vol. 36, No. 5 (Feb. 1966), pp. 16-18.

[3] Morris Meister and Abraham Tauber, "Experiment in Exploring Education Opportunity for the Disadvantaged," *Phi Delta Kappan*, March 1965.

3. Contribution to Vocational Education

The college-level Industrial Technology Curriculum (for which the experimental Vestibules serve as preparation) emphasizes career rather than liberal arts education. OPERATION GIANTSTEP seeks the most effective program for preparing the "average" disadvantaged high school graduate for a technical career. In so doing, it makes a contribution to vocational education.

4. Stress on Innovation

OPERATION GIANTSTEP proposes to use innovations in teaching and administration both during the preparatory Vestibules and also the college-level Industrial Technology sequence. Both aspects of the project involve new curricula and will search for fresh approaches. In comparison, neither "Upward Bound" nor "College Discovery" programs make any adaptations or changes of courses once the student reaches the college level. He takes the traditional courses, and efforts are made to avoid disclosure of his previous association with these preparatory programs.

Treating the disadvantaged as regular students and enrolling them in traditional courses may be effective for those specially selected as "most promising," and such practices may be administratively convenient for the sponsoring institution, but OPERATION GIANTSTEP project-planners do not feel them to be satisfactory for the average disadvantaged student this project seeks to help. OPERATION GIANTSTEP complies with the special needs of its participants by postponing to the second year of the Industrial Technology Curriculum courses such as social studies, literature, and mathematics required for the AAS degree.

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[1] This is consistent with the opinions of the directors of the "Upward Bound" Program who ". . . [do] not encourage the selection of seniors [for their summer programs] since . . . more time is needed to work with really disadvantaged young people." Special Report on Federal Programs, American Council on Education, Washington, D.C. Vol. IV, No. 3 (May 1966), p. 2.

F. Instructional Emphases, Philosophy, and Rationale

1. Key Questions

In the preparation of this proposal a number of experts were consulted. One of them, Dr. Charles M. Shapp,[1] who has had wide experience with the education of disadvantaged students in New York City, asked the following searching questions about the proposal:

a. Question 1: If the students in the program were minimal learners in all their many previous years of schooling, why should you expect the proposed program to be more effective?

b. Question 2: The disadvantaged young men in the proposed program have suffered spiritual and psychological damage as a result of sociological, economic, and environmental factors. What will the program do to build up and sustain whatever positive impulse motivates them to seek further education?

c. Question 3: The variegated curricula of the elementary and secondary schools did not succeed in making reasonably good students of those you propose to admit. Why should your program, which will be more technical and difficult, be expected to achieve what the others failed to do?

2. Answers to Key Questions

a. Answer to Question 1 (Teachers and Teaching Methods): Teachers and teaching methods will be carefully selected. Teachers must have demonstrated competence in working with disadvantaged students and developing empathy with them, or they must be indoctrinated with optimistic attitudes. "The teacher's faith in the ability of children from slum neighborhoods may be the most important factor in any effort to improve such youngsters' behavior and study habits. This is the conclusion of a two-year government-financed study. . . ."[2] Loretan, New York City's Deputy Superintendent in Charge of Curriculum and Instruction, confirms this: "Teahcers of the disadvantaged must have a feeling of confidence in their students. Teachers who have made up their minds that these children cannot learn, do not care to learn, and have parents who are not concerned are bad risks as teachers for the disadvantaged."[1]

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[1] District Superintendent, Board of Education, City of New York, School District 10 (Bronx).

[2] New York *Times* report dated 3/13/66 on outcomes of a study of the All-Day Neighborhood School Program by New York University under a grant from the U.S. Office of Education.

Teaching will be innovative. Instruction will be given in short, self-contained, four-week units called "modules." The frustration that comes to students who get off to a poor start in a semester-long subject will thus be avoided. Tutoring and help will be close at hand, and attractive study quarters available in case of lack of such facilities at home. Instructional modules not successfully mastered can be repeated easily; those not needed can be omitted, and others more useful to the individual can be substituted.[2] As indicated in Section 5D, the modular structure affords exceptional administrative flexibility. Instruction itself will be innovative; whenever possible it will be shop-centered rather than book-centered. Remedial instruction in arithmetic, for example, will involve the construction and use of simple calculating "machines" and checking the accuracy of the results so obtained with commercial machines of various types. As another example, blueprint reading, a necessary part of the training of the technician, tends to be rather dull in traditional courses, and usually consists of answering questions based on drawings. What is proposed is to cast the student in the role of an inspector who checks an actual part against the drawing from which it was made; a student's performance will be judged on the number of "defects" he can find. In addition to providing motivation through a realistic activity, examining real objects is particularly appropriate for providing related instruction in the practical use of measuring instruments and gauges common in industry.

b. Answers to Question 2 (Building and Sustaining Motivation): Participation in this new program will in itself provide strong motivational influences. A deliberate campaign will be mounted by the project staff to encourage the feeling that the faculty, the staff, the college, and the government all care about each individual student and that his success is important.

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[1] Loretan and Umans, p. 5.

[2] This will not be done during the Experimental Phase but will otherwise be a regular feature of the Vestibule Program.

c. Answer to Question 3 (Justification for a Favorable Prognosis): The proposed program has a better chance of success than those of the lower schools precisely because the students are more mature.

Those admitted are a special group: whatever their other limitations, they did graduate from high school. This indicates that they have, on the average, more persistence than those who dropped out; that they were able to evade economic pressure to find full-time employment; that during their high school years the attitude of their families towards education was favorable; or finally that though marginal students, they are empirically better than those who failed. Thus we start out with a group which has relative promise.

The target group has been trained neither for employment nor for college. With maturity and the need to find employment comes the realization that only menial, unrewarding, or dead-end job openings are available, unless they can get further training. Therefore, such training should be sought for and accepted more eagerly.

Finally, the "prestige factor" of being *college*-trained must not be overlooked. These students are high school graduates. Training programs set up for "post-graduate" trade-training in high school settings[1] involve serious loss of self-esteem for high school graduates who enroll, especially if they are brought into contact with younger students. Their reaction may be: "I graduated. What am I doing back in high school?" Thus a training program given under college auspices, within the college setting, has psychological advantages. Attending college has become a status symbol. For the disadvantaged young man to be able to say, "I am a college student" is to enhance his self-esteem. If the same youth as a job-seeker can say, "I am college trained," his acceptability may well be greater because most employers recognize that college preparation provides more than mere vocational training, and that maturity, responsibility, and other attributes of good citizenship are found more often among the college-trained.

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[1] For example, "Pre-employment Trade Courses for High School Graduates." These courses are offered only to the "most promising" applicants who can pass qualifying examinations. Instruction in various trade specialties is given six hours per day in five high schools. "Staff Bulletin," April 4, 1966 (Board of Education, City of New York).

SECTION 3: OBJECTIVES

A. General Objectives

This project addresses itself to two related objectives. These are: (1) the development, operation, and evaluation of two educational programs for disadvantaged youth, and (2) research to determine principles and practices that will assist in the development of effective post-high-school remedial and vocational programs.

The educational programs are (1) a remedial, preparatory (or Vestibule) program to prepare average general diploma graduates for vocational training and education at the community college level, and (2) an Industrial Technology Curriculum that will provide vocational competence of a kind needed by industry and within the capabilities of this group.

The two educational programs and a follow-up (on-the-job) period will provide the framework for implementing and evaluating research concerning the remedial program.

B. Remedial (Vestibule) Program

The goals of the Vestibule program are to:

1. organize a preparatory program that will:

    a. improve student motivation and self-image;

    b. provide vocational instruction that will start providing marketable skills at once;

    c. give remedial instruction in "academic" subjects";

    d. give group counseling, and make available tutoring and programed instruction.

2. facilitate research through the organization of instruction into four different patterns to which students will be assigned at random. These patterns will differ in duration and curricular emphasis.

3. utilize curricular materials and instructional procedures developed for this purpose under U.S.O.E. Project ERD-553.

4. refine curricular materials and instructional procedures and make these available for dissemination.

C. Industrial Technology Curriculum

The goals of the Industrial Technology Curriculum are to:

1. develop an associate degree program in mechanical, electrical, and electronic technology at the industrial technology level (as differentiated from the engineering technology level). This curriculum will utilize a composite of content, organization, and techniques not presently available in the New York City community colleges and is designed to serve disadvantaged youths.

2. utilize curricular materials and instructional procedures developed for this purpose under Project ERD-553, and develop additional materials.

3. to refine these curricular and instructional materials and make them available for general dissemination.

D. Research

The goals of the proposed research are to:

1. determine the relationships between two remedial treatment variables and two defined success variables.

a. the treatment variables are duration and curricular emphasis.

b. the success variables are success in college and success on the job.[1]

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[1] Variables are defined further in Section 5A.

2. answer a number of questions about the efficiency of the two educational programs for disadvantaged youth.

a. Do subjects participating in preparatory programs do better in the Industrial Technology Curriculum than control subjects drawn from the same population?

b. To what extent does the two-year community college Industrial Technology Curriculum assist the trainees to acquire, retain, and advance in the technical positions in industry for which they are prepared, i.e. "Success on the Job?"

c. Can the data accumulated during the program be used to develop a more reliable prognostic instrument than those presently available and so lead to more efficient training programs by sparing students without the attributes found to be associated with success the trauma of further frustration and failure?

3. utilize the research design and procedures developed under Project ERD-553.

4. contract with an appropriate university-related agency to refine and monitor the research procedures and to provide the necessary evaluation.

5. prepare a description of the research and make it available for dissemination.

E. Industrial Technology Curriculum and Vestibules as Permanent Additions

The project planners and the administration of the Bronx Community College of the City University of New York anticipate that the programs developed in OPERATION GIANTSTEP will be phased into the permanent curriculum of the College as the experimental phases of the project terminate.

The College has been considering for some time the need for such programs but has not been able to obtain the necessary funds. OPERATION GIANTSTEP will offer the College tested programs derived from research. Such controlled and revised programs promise to be superior to what would probably be developed through conventional curricular evolution.

SECTION 4: ADMINISTRATION

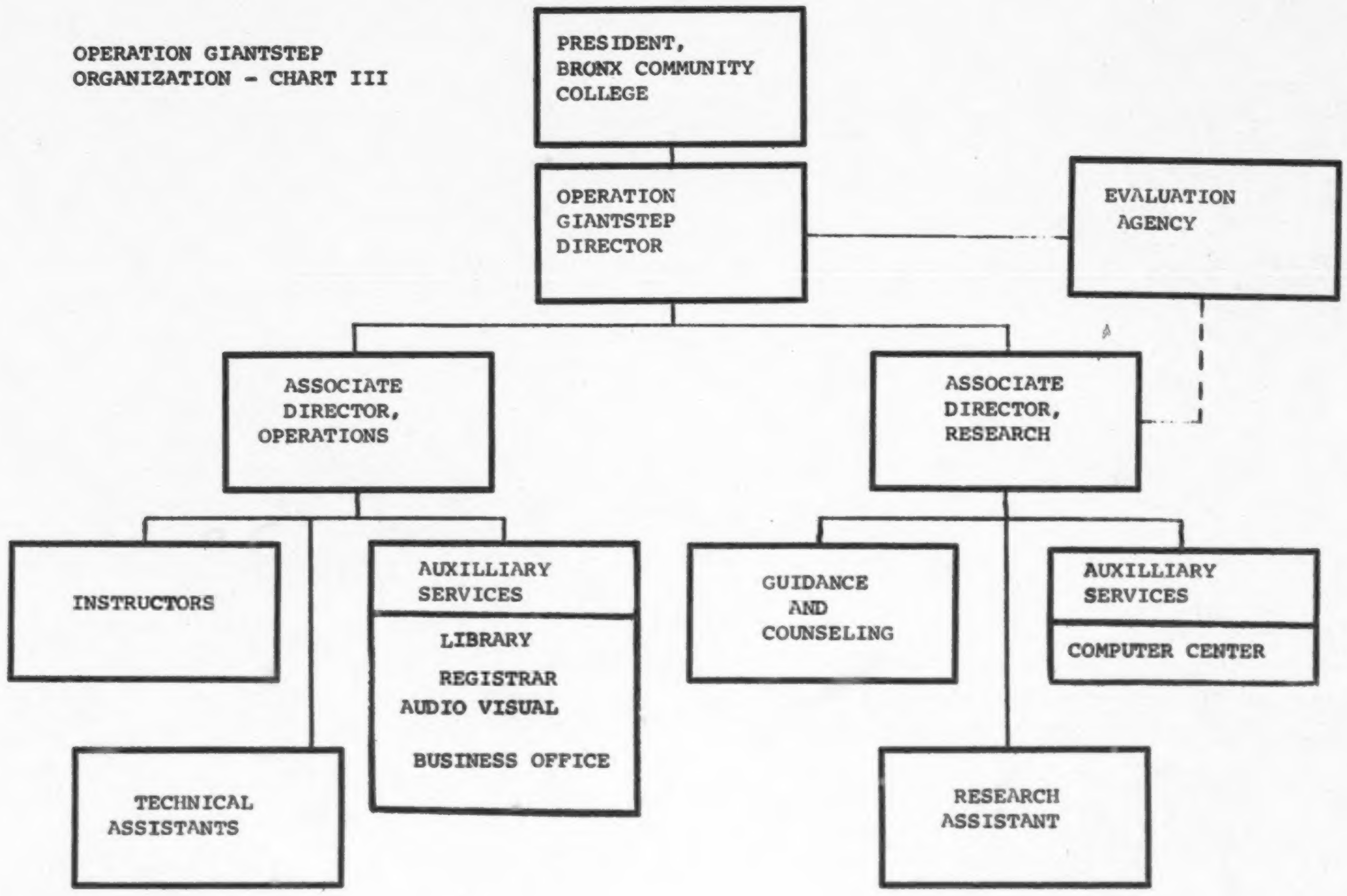
A. Plant

The preparatory periods (Vestibules) and first year of the Industrial Technology curriculum of the proposed project will operate mainly in rented space within walking distance of the college. Two mechanical shops in the existing college plant will be shared by OPERATION GIANTSTEP students. The facilities selected will be readily accessible to public transportation so that students may be drawn from a wide area. Required Laboratories and Shops will be installed. Suitable space has been located in a building two blocks from the main campus. The other space in this building has been rented by the College for other programs.

B. General Organization of Project

This is shown in CHART III below:

OPERATION GIANTSTEP
ORGANIZATION - CHART III


PRESIDENT, BRONX COMMUNITY COLLEGE
OPERATION GIANTSTEP DIRECTOR
EVALUATION AGENCY
ASSOCIATE DIRECTOR, OPERATIONS
ASSOCIATE DIRECTOR, RESEARCH
INSTRUCTORS
AUXILLIARY SERVICES
LIBRARY
REGISTRAR
AUDIO VISUAL
BUSINESS OFFICE
TECHNICAL ASSISTANTS
GUIDANCE AND COUNSELING
AUXILLIARY SERVICES
COMPUTER CENTER
RESEARCH ASSISTANT

1. Teaching Personnel

This project will avoid the use of part-time personnel wherever possible. This results from the plan to schedule classes and activities from 8:00 a.m. to 4:00 p.m. and from the desire to use as teachers those whose energies are fresh and whose interests and loyalties are undivided.

Staff will include teachers and remedial experts on leave from the high schools, former peace corps teachers, and college faculty. Good salaries and conditions of employment will be used to attract qualified people.

2. Non-Teaching Personnel and Services

a. The Project Director

The Project Director will be responsible for the coordination of all aspects of the project. He shall be responsible to the President of the College. It is estimated that this function will require thirty percent of a full-time college position.

b. The Associate Director of Operations

A full-time Associate Director of Operations will be in charge of administration and budget, supervision of teachers and staff.

c. The Associate Director for Research

The Associate Director for Research will be in charge of research activities and data gathering, and will provide liaison with the evaluation agency.

d. Technical Assistant - Education

The Educational Resources Associate will be in charge of the Tutor center. He will seek ways to expedite and improve instruction by providing assistance to the instructors in obtaining supplies, setting up visual aids, and providing duplicating services from the appropriate college departments. He will be responsible to the Associate Director of Operations.

e. Laboratory Technician

A Laboratory Technician will be in charge of all equipment and tools. He will assist the instructors in the operation of the shops and laboratories. He will also arrange for purchasing, renting, receiving, and dispensing technical equipment and supplies. He will be responsible to the Associate Director of Operations.

f. Clerical Positions

Two full-time clerical positions and funds for part-time assistance during peak loads are anticipated needs.

g. Services Provided by College Departments

1. Registrar - Maintain all official College records.

2. Business Office - Transact all business and financial matters and keep all financial records.

3. Library - Facilitate the use of library resources by OPERATION GIANTSTEP students and provide advice for establishing and operating the Tutor Center.

4. Computer Center - Arrange for use of data processing facilities and act as liaison with the major data processor.

h. Evaluation

The evaluation of this project will be the responsibility of an independent agency, probably the Center for Urban Education (the regional educational laboratory for the metropolitan area), or possibly the Center for Field Research and School Services of New York University; both agencies have stated a willingness to undertake this work on a contract basis when the project becomes operational.

The major portion of the data processing required for this project will be contracted to an independent agency. The college has been using outside agencies for some time and feels assured that a suitable contract can be negotiated.

C. Absorption of Program into the College Structure

1. Industrial Technology Curriculum

It is planned that when the project has completed its Experimental Phase, the two-year Industrial Technology Curriculum will become a regular career offering of the College after its adoption and approval by the New York City Board of Higher Education and the State University of New York. The new curriculum will be integrated into the existing Department of Engineering Technologies unless the enrollment is large enough to require the establishment of a new Department of Industrial Technologies.

2. Vestibule Program

In February 1966, the Board of Education, working with a grant from the Ford Foundation, started an ambitious curriculum redevelopment project for the high schools of New York City. The intention is to so modify the existing "general course" that graduates may qualify for entrance directly and automatically into the community colleges.[1]

If this Board of Education program is fully operational by 1972, as scheduled, it would appear that the need for the special preparatory periods (Vestibules) would disappear. Actually, the need for Vestibules may diminish, but it is unlikely to disappear. There is no assurance that the proposed high school program will be wholely successful in its objective of preparing graduates for direct admission to college; and Vestibules will still be needed for those not yet qualified for direct admission.

D. Advisory Groups

1. Curricular Advisory Council

During the preparation of this proposal the project planners had the assistance of numerous distinguished educational and research consultants who contributed to the basic plan of the proposed project both before and since the present authorization from the Office of Education under which this proposal is being developed (ERD-553). The names and qualifications of those who contributed are given in Section 7 - Personnel. It is expected that these individuals will continue to be available as a Curricular Advisory Council for consultation and other help if the present proposal (for the operational phase of the project) is approved.

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[1] Board of Education (NYC), Office of Curriculum Research and Evaluation, Brochure: *A New Correlated Curriculum for General Education in the High Schools*, Sept. 20, 1965, p. 3. Objective 12 "To establish a program whereby the community colleges . . . agree to automatic acceptance of students who have satisfactorally followed the new correlated curriculum for general education.

2. Advisory Board and Community Resources Council

Since the program is concerned with the training of Industrial Technicians, it is essential to have representatives of industry participate by serving on an Industry Advisory Board which will be set up early in the project. The function of the Board will be to recommend practices and procedures for the technical aspects of the training, suggest modifications, or offer counsel in the operation of the program. In addition, it is planned to use this group to establish liaison with local industry in facilitating cooperative arrangements such as visits of students to industry and guest lecturers from industry.

SECTION 5A: GENERAL DESIGN

Summary

This sub-section describes the general design of the Developmental and Experimental phases of OPERATION GIANTSTEP. The design is considered particularly appropriate for achieving the objectives stated in Section 3 because it is based in part upon suggestions of the U.S. Office of Education Review Panel. The composition of Experimental and Control groups is indicated. (In accordance with the suggested outline, the criteria for selection of the participants are described elsewhere in Section 5C.)

Outline

I. Operational Plan

Introduction
- A. Composition and Schedule of Student Group I (Developmental Phase)
- B. Composition and Schedule of Student Group II (Experimental Phase)
- C. The Developmental Phase

  1. Developmental Vestibules (Group I)
  2. Structure of Treatment

- D. The Industrial Technology Curriculum
- E. On-the-Job-Phase
- F. The Experimental Phase

  1. Experimental Vestibules (Group II)
  2. Controls

- G. Additional Procedures

  1. The Teaching Staff
  2. Industrial Advisory Board

- H. Discussion of Operational Plan

II. Research Design

Introduction
- A. Population
- B. The Sample

C. Variables

   1. Independent Variables
   2. Extraneous Variables
   3. Dependent Variables

D. Experimental Hypotheses
E. Instrumentation and Data
   1. General Description
   2. Measuring Before and After Characteristics
   3. Measuring Performance in the Vestibule Program
   4. Measuring Performance in the Industrial Technology Curriculum
   5. Measuring Performance on the Job

SECTION 5A: GENERAL DESIGN

I. Operational Plan

OPERATION GIANTSTEP consists of four partially overlapping phases:

1. an administrative tooling up period;

2. Developmental Phase (consisting of a Vestibule Program plus Industrial Technology Curriculum); this is a try-out and run-through of the entire instructional program;

3. Experimental Phase: A full run of the now pretested instructional program (consisting of a sixteen or thirty-two week Vestibule plus the two-year Community College Industrial Technology Curriculum) *except that Control Students enter the Industrial Technology Curriculum directly.*

4. Follow-up of on-the-job experience.

The operational plan is represented diagramatically in CHART IV on the following page. The Developmental Phase is shown shaded. Each segment of each phase is shown in its relative time position. Vestibule sequences of different duration (sixteen or thirty-two weeks) or of different curricular emphasis (vocational or academic) are shown separately.

The composition, general schedule, and purpose of the various groups of student participants follow.

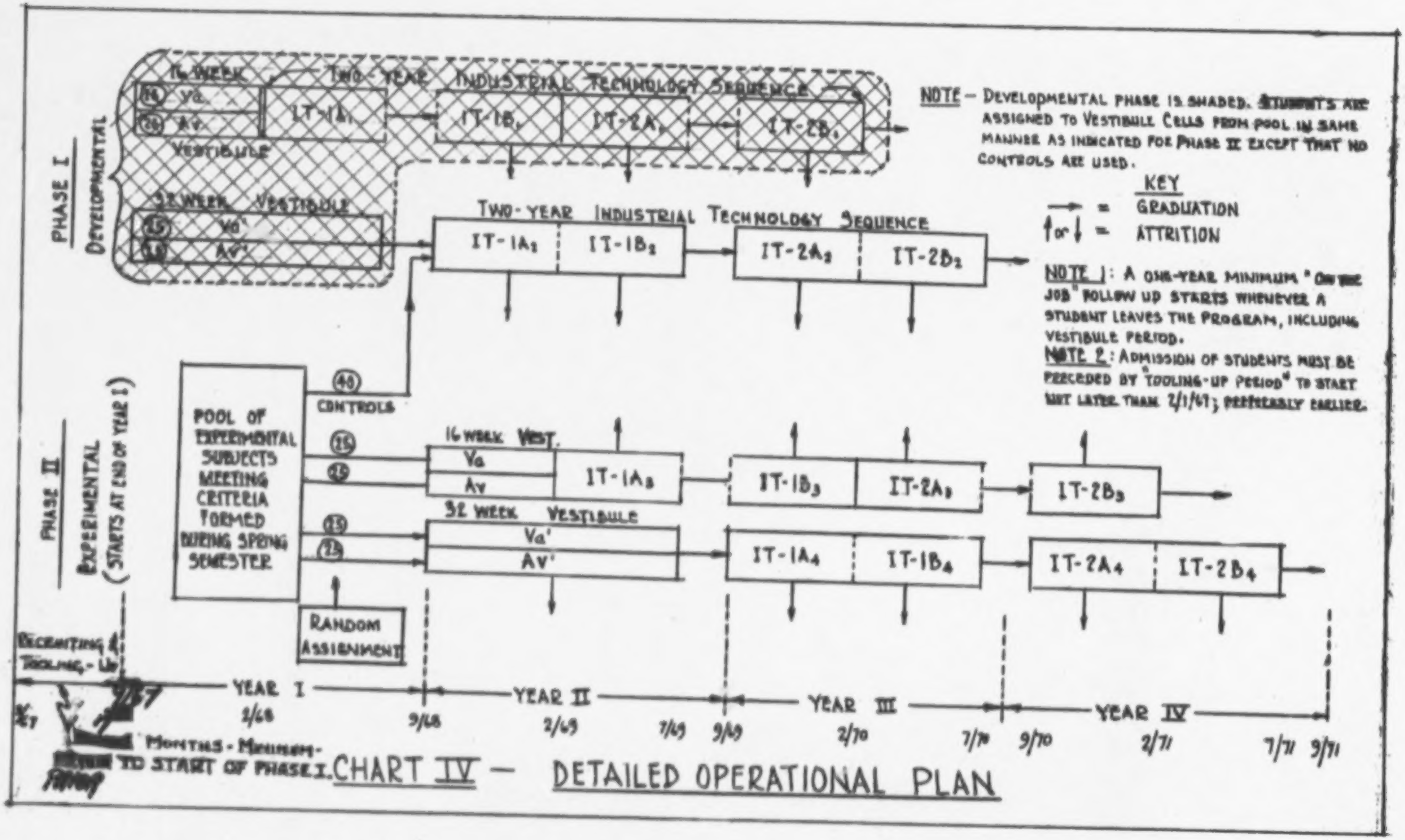
A. Composition and Schedule of Student Group I (Developmental Phase)

A-1. Group I consists of approximately 100 students.

A-2. No Controls are used.

A-3. On a random basis, half the students are assigned to the sixteen-week Vestibules, the other half to thirty-two-week Vestibules. Half the Vestibules have a vocational emphasis, the other half "academic."

CHART IV


PHASE I
DEVELOPMENTAL
16 WEEK
Va
Av
VESTIBULE
32 WEEK VESTIBULE
Va'
Av'
TWO-YEAR INDUSTRIAL TECHNOLOGY SEQUENCE
IT-1A₁
IT-1B₁
IT-2A₁
IT-2B₁
TWO-YEAR INDUSTRIAL TECHNOLOGY SEQUENCE
IT-1A₂
IT-1B₂
IT-2A₂
IT-2B₂
PHASE II
EXPERIMENTAL
(STARTS AT END OF YEAR I)
POOL OF EXPERIMENTAL SUBJECTS MEETING CRITERIA FORMED DURING SPRING SEMESTER
40
CONTROLS
25
25
16 WEEK VEST.
Va
Av
IT-1A₃
IT-1B₃
IT-2A₃
IT-2B₃
25
25
32 WEEK VESTIBULE
Va'
Av'
IT-1A₄
IT-1B₄
IT-2A₄
IT-2B₄
RANDOM ASSIGNMENT
RECRUITING & TOOLING-UP
YEAR I
2/68
9/68
YEAR II
2/69
7/69
9/69
YEAR III
2/70
7/70
9/70
YEAR IV
2/71
7/71
9/71
MONTHS - MINIMUM - TO START OF PHASE I.

NOTE – DEVELOPMENTAL PHASE IS SHADED. STUDENTS ARE ASSIGNED TO VESTIBULE CELLS FROM POOL IN SAME MANNER AS INDICATED FOR PHASE II EXCEPT THAT NO CONTROLS ARE USED.

KEY

→ = GRADUATION

↑ or ↓ = ATTRITION

NOTE 1: A ONE-YEAR MINIMUM "ON THE JOB" FOLLOW UP STARTS WHENEVER A STUDENT LEAVES THE PROGRAM, INCLUDING VESTIBULE PERIOD.

NOTE 2: ADMISSION OF STUDENTS MUST BE PRECEDED BY "TOOLING-UP PERIOD" TO START NOT LATER THAN 2/1/67; PREFERABLY EARLIER.

CHART IV – DETAILED OPERATIONAL PLAN

A-4. Upon completion of a Vestibule sequence, students begin the new two-year college-level Industrial Technology Curriculum.

Purpose of Group I: to serve as a vanguard for Group II (which enters the program one year later), and thus enable OPERATION GIANTSTEP to develop, try out, evaluate, and strengthen its innovative instructional and administrative procedures.[1]

B. Composition and Schedule of Student Group II (Experimental Phase)

B-1. Group II enters the program one year after Group I starts.

B-2. Group II consists of approximately 100 *Experimental* Students and fifty Controls.

B-3. On a random basis, half the *Experimental* Students are assigned to sixteen-week Vestibules, the other half to thirty-two week Vestibules. Half the Vestibules have a vocational emphasis, the other half "academic."

B-4. Upon completion of the Vestibules, Experimental Students begin the two-year college-level Industrial Technology Curriculum.

B-5. Controls begin the two-year college-level Industrial Technology Curriculum without any preparatory Vestibule training.

Purpose of Group II: to determine which elements and which patterns in the Vestibules are most helpful to students in their subsequent two-year college-level Industrial Technology Curriculum, and, later, on the job.

C. The Developmental Phase

The Developmental Phase is a facsimile of the Experimental Phase that it precedes. It will serve as a dry run to test procedures, curriculum, instrumentation, and data processing.

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[1] The project planners believe this Developmental Phase is essential to assure the validity of the Experimental Phase which follows it. Most of the instructional and supportive programs will be new, as will be the staff and physical plant. A "shakedown" period is essential to expedite the program.

During this period a better understanding of the population parameters will be explored through testing and observation of performance. A factor analysis will be undertaken to determine if it is desirable to include some composite of personal inventory data as an additional experimental variable.

1. Developmental Vestibules (Group I)

Approximately one-hundred-fifty students will be randomly selected from a pool. A description of the procedures for the solicitation of the pool and the selection of the subjects follows (Section 5C). Through an estimated attrition of about 30%, this group will eventually contain approximately one-hundred students. On a random basis this group will be assigned to the four Vestibule treatment cells containing approximately twenty-five students each. No control group is used during this phase.

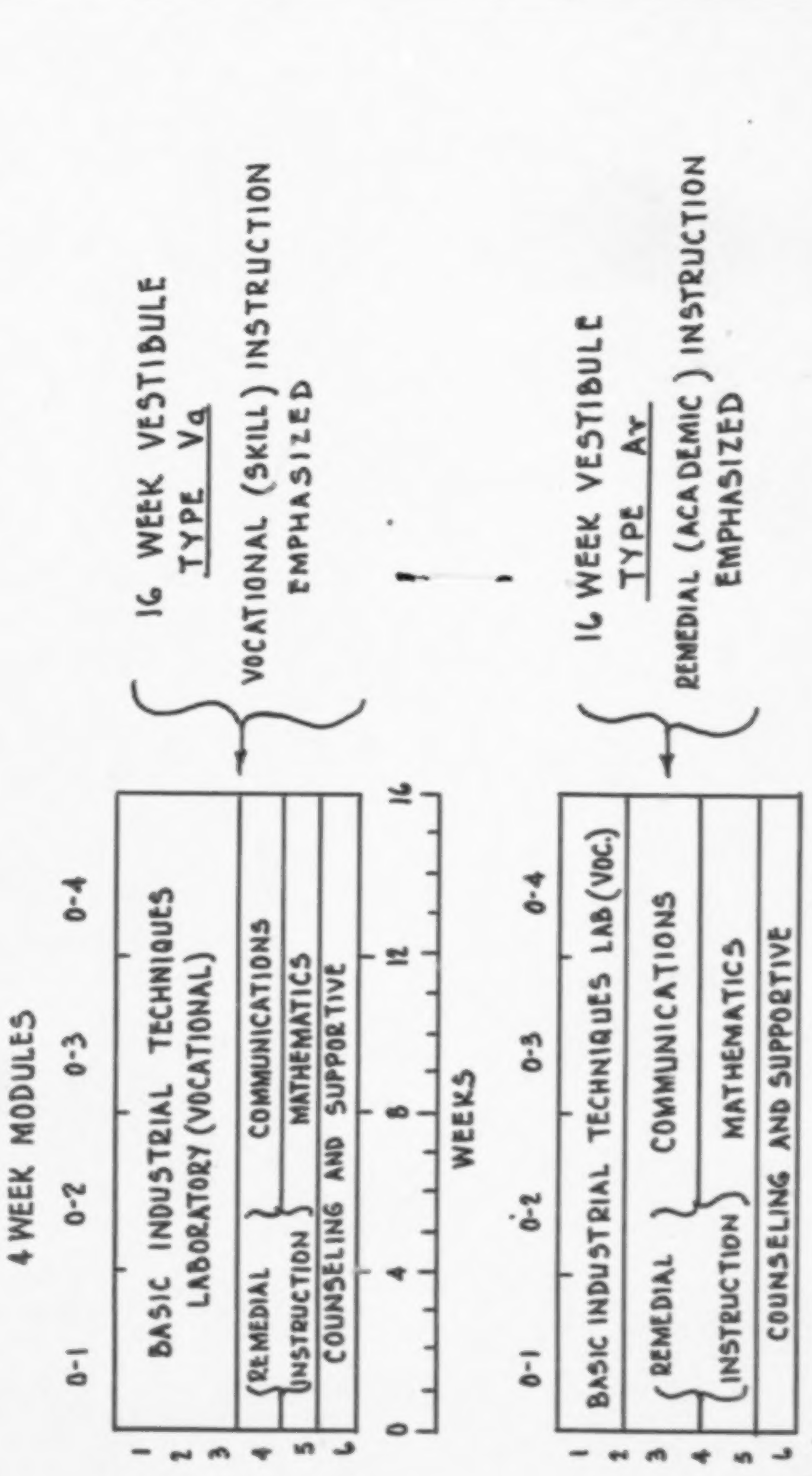
2. Structure of Treatment

Vestibule instructional units, called "modules," are given in time blocks of four week each. The characteristics and content of these are discussed in Section 5D.

a. Sixteen-Week Vestibules: CHART V on the following page illustrates the structure of the two types (vocational or academic emphasis) of sixteen-week Vestibules. The horizontal time scale in weeks shows that each of the four modules is four weeks long. The vertical time scale shows the number of instructional periods devoted, on the average, to different subjects each day. For example, in the Type Va Vestibule, which emphasizes vocational training, three periods are devoted each day for sixteen week to "Basic Industrial Techniques Laboratory," while one period each day is devoted to remedial.instruction in Communications Skills and one to Mathematics. The remaining period may be divided between individualized programed instruction, tutoring, counseling, and similar supportive services as they are needed. In the Type Av Vestibule, however, the number of periods allocated daily to Vocational (V) and Academic (A) instruction is reversed, so that the latter now is emphasized. Hence "Va" indicates vocational emphasis, while "Av" indicates academic emphasis, although both elements are present to some extent in both types.

b. Thirty-Two Week Vestibules: CHART VI on page 5-6 illustrates the structure of the two types of thirty-two-week Vestibules, designated Va' and Av'. Like the sixteen-week Vestibules, these have either a vocational or an academic emphasis. The division of daily instructional

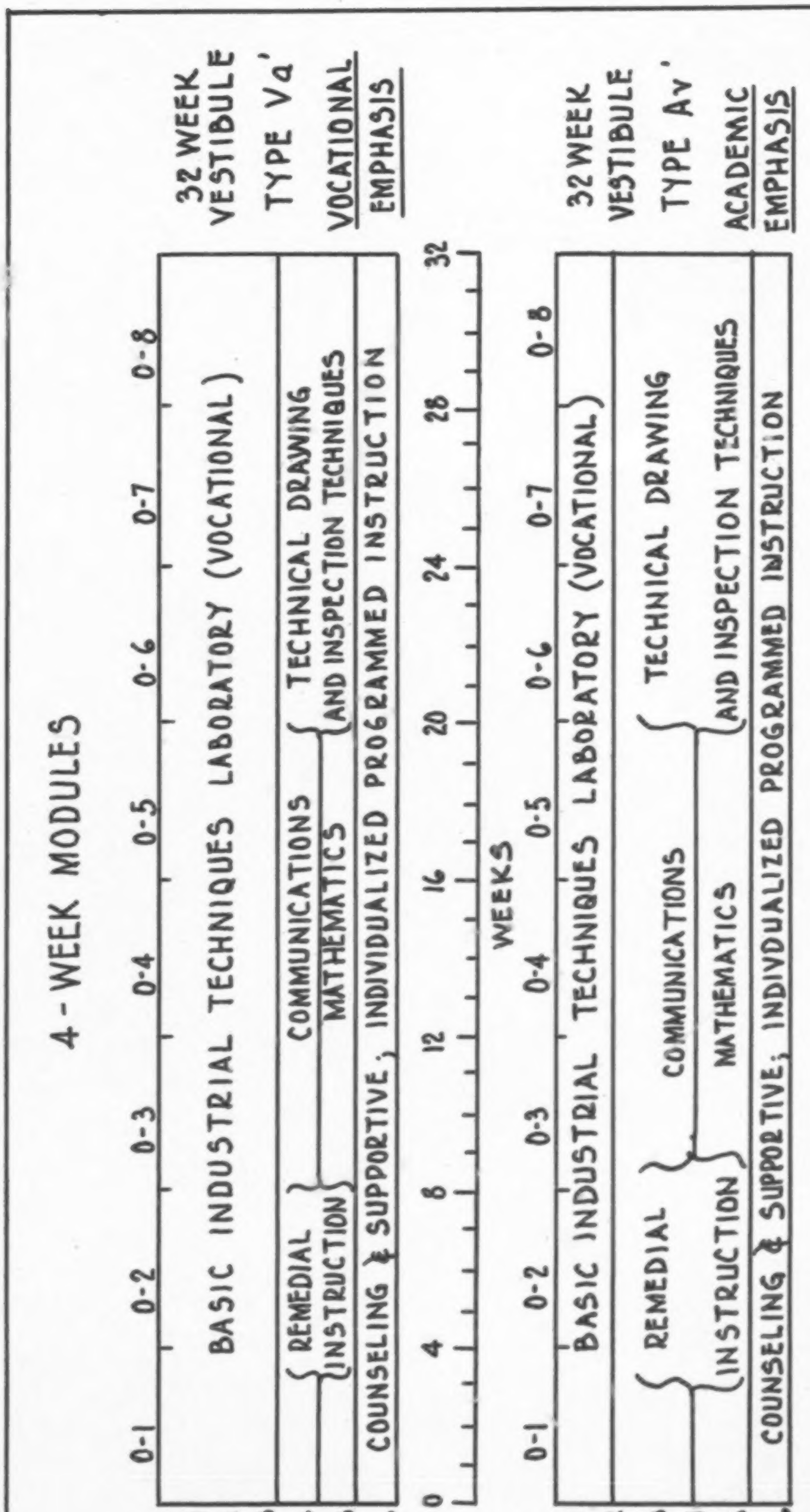
CHART V


INSTRUCTIONAL PERIODS PER DAY (AVG.)
4 WEEK MODULES
0-1
0-2
0-3
0-4
1
2
3
4
5
6
BASIC INDUSTRIAL TECHNIQUES LABORATORY (VOCATIONAL)
REMEDIAL INSTRUCTION
COMMUNICATIONS
MATHEMATICS
COUNSELING AND SUPPORTIVE
0
4
8
12
16
WEEKS
16 WEEK VESTIBULE TYPE Va
VOCATIONAL (SKILL) INSTRUCTION EMPHASIZED
BASIC INDUSTRIAL TECHNIQUES LAB (VOC.)
REMEDIAL INSTRUCTION
COMMUNICATIONS
MATHEMATICS
COUNSELING AND SUPPORTIVE
16 WEEK VESTIBULE TYPE Av
REMEDIAL (ACADEMIC) INSTRUCTION EMPHASIZED

NOTE: Experimental groups taking 16 week vestibules are randomly assigned to types Va and Av, equally.

CHART V - VESTIBULE STRUCTURE
(16 WEEK VESTIBULES)

CHART VI



NOTE: Experimental group members taking 32 week vestibule are randomly assigned to types Va' & Av' equally

CHART VI - VESTIBULAR STRUCTURE
(32-WEEK VESTIBULE)

time is essentially the same as above except that with more time available, the general instructional approach is more easy-going and extensive than is possible with the sixteen-week Vestibules.

Courses related to vocational instruction, such as Technical Drawing and Inspection Techniques, are added.

In the thirty-two week Vestibules only four days of each week are devoted to formal instruction. The fifth day, possibly a Wednesday or else a morning and afternoon of two different days, will be available for study and participation in college-wide or field activities.

Students in both the sixteen- and thirty-two-week Vestibules receive comparable tutoring, individually assigned programed instruction, counseling, and other supportive activities on an as-needed basis. These supportive services will be limited to ten per cent of instructional time.

D. The Industrial Technology Curriculum

The Industrial Technology Curriculum is a two-year community college curriculum leading to the A.A.S. degree. It has been designed for this project. A discussion of the Industrial Technology Curriculum follows in Section 5D. Student performance in this curriculum will be used as one of the means of evaluating the Vestibule Program.

E. On-the-Job Phase

Contact will be maintained with students during this period to facilitate the gathering of data. Neither the College or the project staff will engage in job placement activities for graduates or students who leave during this project. They will be referred to the appropriate state employment agency.

F. The Experimental Phase

Each segment of the Experimental Phase starts after the equivalent part in the Developmental Phase is completed. CHART V shows the time relationship. During the Experimental Phase all procedures will be kept fixed and special care will be taken to maintain control.

1. Experimental Vestibules (Group II)

The same number of students will be chosen by the same procedures (as for the Developmental Phase) with the exception that modifications resulting from experience during the Developmental Phase will be incorporated. If factor analysis used with Group I has led to a decision to include a personal inventory variable in the study, the sampling procedure will need to be modified to institute appropriate stratified sampling.

2. Controls

A Control Group of fifty students will be chosen by random procedures from the same pool as the Experimental Group. Control Students will be enrolled in the Industrial Technology Curriculum without any preparatory (Vestibule) training. Their treatment in the Industrial Technology Curriculum and later on the job will be identical with that for the other students. All students, including Controls, will be assigned to classes on a random basis.

G. Additional Procedures

It is a social science truism that to study the individual apart from his social field, to exclude interaction between the person and "significant others" in his social field, is to disregard essential factors.

For the purposes of this study "significant others" for the students comprise two groups -- his teachers and those representatives of industry who as a group facilitate or inhibit his entrance to the job world.

1. The Teaching Staff

At specified times during the Preparatory and Experimental Phases of this program, teachers in group meetings will be asked to evaluate the status of their students. The purpose for this is not primarily to gather data on students but to determine (a) to what extent teachers' attitudes may facilitate or inhibit the program's goals; (b) what might be done to alter faculty attitudes that may be interfering with the program. Content analysis will be done of the minutes of these meetings, each session of which will focus on a selected number of students and selected problems.

2. Industrial Advisory Board

An Industrial Advisory Board will be recruited and organized during the tooling-up period. Representatives of industries employing industrial technicians will constitute the job market for the graduates. Although advice of industrial representatives has been solicited on an individual basis, it is anticipated that a sharper understanding of suitable curricular content will develop through group discussion. These understandings will be incorporated into the program until the start of the Experimental Phase; however, to preserve the research design, the curriculum will not be changed during the Experimental Phase.

The industrial community represented on this Board will determine in a most decisive, if indirect way, if OPERATION GIANTSTEP is successful. Members of this board hold positions in which they make policy relevant to the hiring, retention, promotion, or firing of employees with the training and skills OPERATION GIANTSTEP graduates will have.

At specified times during the Preparatory and Experimental Phases, members of the Board will be asked to evaluate the status of the program. The purpose of these meetings is to determine during the pre-job phase of the program to what extent attitudes (of this representative Board toward the type of student in this program) may facilitate or inhibit the program's goals.

At times, the teaching staff and/or representatives of the student body may attend these meetings to serve as "consultants" when Board members are reviewing particular areas.

H. Discussion of Operational Plan

In summary, the program consists of a tooling up phase; an experimental Vestibule Phase (consisting of a number of four week modules differing in duration and instructional emphasis); a two-year Industrial Technology community college Curriculum phase; and a job phase.

During the tooling up phase selection procedures and orientation for students will be refined; teacher orientation will be begun; and the Advisory Board will be developed. Techniques and standard instruments to study those behavioral factors which may impede or expedite the two major goals of the study (success in school and on the job) will be developed.

During the Developmental Phase the academic success criteria (grades, dropping out, absence, and lateness) can be more critically evaluated and perhaps other significant criteria added. The project may also have the opportunity to study the work success criteria (time at work, job title, salary, raises, absence and lateness record) of students dropping out of the Vestibule program and going to work.

Following the Experimental Phase any relationships between students' success and Vestibule training will be studied by analyzing the academic success data for Experimental and Control Students.

Whatever effects a Vestibule program has, generally, on job success will be studied by contrasting the Experimental and Control students at given points while they are employed.

Lastly, the role that the teacher as well as industry has in the development of these students and their future performance will be evaluated from data collected from group interviews, as well as from more formal tests and interviews.

Factorial design, analysis of variance, will be used in the data analysis. For some evaluations, given relatively small samples, non-parametric statistics will be used. See Part II of this section, following, for additional details.

II. Research Design

The major research effort in this project is the determination of principles and practices that will assist in the development of more effective post-high-school remedial programs.[1] This project limits its major research effort to the investigation of two treatment variables, *duration* and *curriculum emphasis*. A number of secondary questions will also be explored.

A sample of the population (i.e., general-diploma high school graduates) will be randomly selected and assigned to five groups: four Experimental of twenty-five students each, and a Control Group of fifty students (divided into two subgroups). A factorial design will be employed to determine independent and interactive effects of two independent (treatment) variables and of each of a number of dependent variables in a 2 x 2 design.[2]

DIAGRAM OF DESIGN

Duration	Curriculum Emphasis	
	Vocational	Academic
16-Week Program	16Va 25 Subjects	16Av 25 Subjects
32-Week Program	32Va 25 Subjects	32Av 25 Subjects
Controls No Treatment	50 Subjects	

---

[1] U.S. Office of Education Review Panel comments: "What we need to know is: Which is the best *pattern* for a remedial period? How *long* does it need to last? A summer? A semester? A whole academic year? Research along these lines is necessary now. . . ."

[2] Fisher, R. A. *The Design of Experiments*, 6th Ed. New York: Hafner, 1951, pp. 91, 92.

The relative success of Experimental and Control students in the two-year Industrial Technology Curriculum they take in common (and the on-the-job experience afterwards) provide a means for evaluating the effectiveness of the Vestibule program. In addition, contrasing the data from the Control and the Experimental Groups will serve to replicate the accepted idea that remedial program do work.[1]

The treatment cells have a sufficient number of students so that one additional independent variable might be included without compromising statistical validity. The project planners suspect that it may be useful to include some grouping of personal inventory characteristics, such as high school average and achievement test scores, as an independent variable. The exact nature of this variable, if it seems useful, will be determined (in consultation with the university-related evaluation agency) by factor analysis methods applied to the students during the Developmental Period.[2] If such a modification is made, the design will then have a 2 x 2 x 2 configuration with eight experimental cells; and a stratified sampling procedure would be used to fill the cells for the Experimental Phase.

A. Population

The target population of this experiment is the general diploma graduate. Section 1 discusses the serious needs of this group and the rationale of how this project may ultimately help them. Section 5C describes how these youths will be recruited for the project.

To an extent, these students will be self-selected, and their interest in OPERATION GIANTSTEP will probably be influenced by advice from their high schools, desire to continue their education, interest in engineering-related work, and proximity to the Bronx Community College.

B. The Sample

The sample of Experimental and Control Students will be taken from the general population by techniques that will assure random selection. Random selection will be done before any examination of the students' records or of any recorded contact with them. An overselection will be made in anticipation of attrition. Some selected candidates may not be qualified. Others may fail to show up when called, or may drop the program at so early a point as to be essentially not treated.

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[1] U.S. Office of Education Review Panel comments: "The idea of giving students an intermediate or remedial period before they enter a regular program of technical education is already rather common, and we know it can work successfully."

[2] An approach similar to that suggested by Sullivan and Grant in their paper, "The Development of Interpersonal Maturity: Applications to Delinquencey," might be used.

6

A follow-up of all non-responders and early dropouts will be made to see if they significantly bias the remaining sample.

This random sampling procedure will be applied to the population for the Developmental Phase. Should factor analysis of the Developmental Group show that a personal inventory variable would be useful, procedures will be modified for the Experimental Phase. If deemed useful by the evaluation agency, Experimental Students will be treated as two groups in accordance with this personal inventory variable.

C. Variables

1. Independent Variables.

a. Duration of Vestibule. Experimental Students in this experiment will be given Vestibule training for either sixteen weeks (the equivalent of one semester) or thirty-two weeks (the equivalent of one school year.)[1]

b. Instructional Emphasis. OPERATION GIANTSTEP involves two instructional emphases: *academic* and *vocational*, that is, "liberal arts" subject matter (such as reading improvement, English, science, and mathematics) as compared with vocational subjects (such as shop, applied technology, and laboratory). Each emphasis or treatment contains some elements of the other.

(1) Academic Emphasis (Av). The academic emphasis treatment cells will be exposed to

---

[1] Consideration was given to the inclusion in the design of an eight-week, summer Vestibule. This would have led to complications of timing and control, the solution of which would have increased costs disproportionately.

a curriculum in which approximately two-thirds of the contact hours are academic-remedial in character and one-third vocational-technical.

(2) Vocation Emphasis (Va). The vocational emphasis cells will be exposed to a curriculum in which approximately two-thirds of the contact hours are vocational-technical in character and one-third academic-remedial.

2. Extraneous Variables

a. An attempt will be made to provide identical treatment for each of the four cells exclusive of the independent variables.

(1) Group counseling services will be arranged in identical patterns. Individual counseling will be equally available to all participants.

(2) Teaching will be by the same instructors in each subject area for all four cells. Instructors will be asked to plan their work so that the instruction will be as uniform as possible.

b. To facilitate control over extraneous variables, every member of the project staff will be required to keep a log. This will include reports of classroom or shop periods and of counseling sessions. Logs will be scanned by the research team to pinpoint significant extraneous variables. The nature of the teaching treatment will also be monitored by review of evaluation forms completed by students at the end of each module.

The project staff will attempt to rectify or adjust significant discrepancies in treatment (e.g., an obstreperous student who interferes with instruction, or bad weather affecting one group more than another). If serious instances develop, the investigators may attempt to include consideration of the differences in the analysis and evaluation.

c. A great many conditions may be out of view and control of the project staff. Home conditions and environmental pressures are examples. It is assumed that these will be randomly distributed in the population and will therefore not bias the results. When the project staff becomes aware of intrusive factors, as may happen in the counseling process, records will be kept so that this information will become part of the total data.

d. Differences among students may be so great that personal inventory variables may inject excessive random error into the analysis. During the Developmental Phase, factor analysis will be applied to personal inventory variables to extract any significant construct that might be usefully applied as a controlled variable during the Experimental Phase of the project.[1] Some sources of data that will be studied are a student's school record, his reading level, his home conditions, personality type, and his self-image.

3. Dependent Variables

a. Success in the Vestibule Program. This variable is defined as a composite score involving length of a student's retention in the program, his performance grades in units of required work, and attitudes revealed in questionnaires he fills out after each module.[2]

b. Success in College. This variable is defined as a student's performance in the two-year Industrial Technology Curriculum (taken by all OPERATION GIANTSTEP participants following completion of Vestibule training -- except Control Students who enter the Industrial Technology Curriculum directly). Performance will include length of retention in the Curriculum, attendance record, and grade point average.

c. Shift in Predictor Measures. This experiment employs before and after measures of an Experimental and a Control Group. Validated instruments, such as achievement tests, will be given at appropriate junctures. Instruments will be selected with the assistance of the evaluation agency. This variable is defined as the amount of change in the predictor scores.

d. Changes in Attitudes. Two major elements implicitly associated with school and job success are a positive "self-concept" and high "motivation for learning."

Self-concept is defined as the individual's sense of personal worth, adequacy, and competence. Motivation for learning is defined as a recognition of the goals of learning and their importance to the student. Related to self-concept, motivation is essential to success in any learning activity.

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[1] Kerlinger, Fred N. *Foundations of Behavioral Research*, New York: Holt Reinhart and Winston, 1965, p. 318.

[2] The student (in the Vestibule program) will not know that instructors are assigning grades or critically evaluating his individual performance. Students will know only that they are getting credit for attending and completing modules.

Under consideration for the measurement of this factor will be the student's stated views of life goals and anticipated achievements (i.e. future time perspective).

e. Success on the Job. Success on the job is defined as a composite score associated with job data. This data will include the time required to get the first job, appropriateness of job title, salary, raises, absentee rate, layoffs, new jobs, evaluation by supervisors and evaluation of the job by the Subject. Other factors and an appropriate instrument for gathering and reducing this data will be developed and validated using the Developmental Phase (in consultation with the evaluation agency).

D. Experimental Hypotheses

1. Students who take a Vestibule of thirty-two weeks duration will score significantly higher in the success variables than those who take sixteen weeks.

Comments: The determination (for remedial programs) of an expedient or optimum length is an important research goal.[1] This experiment attempts to test the relative effectiveness of two finite durations. These durations were chosen because they will be easy to administer and staff. Further, if similar programs are to be incorporated into college settings, durations compatible with the ordinary college calendar are more likely to be used. Also, the two contrasted durations are sufficiently different so that the results may have implications toward the construction of improved Vestibule programs elsewhere. The project planners feel that sixteen weeks will be insufficient to provide adequate remediation and attitudinal adjustments for the population of this experiment.

2. Students who take Vestibules with vocational emphasis will be significantly more successful in terms of the dependent variables than those who take Vestibules with academic emphasis.

Comments: Determining the relationship between the curricular content of a remedial program and its effectiveness is an important research aim.

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[1] See footnote reporting U.S. Office of Education Review Panel comments, page 5A-11.

Some educators believe that for the "non-academic" student who cannot "work with his head" it is best to have him work with his hands, especially in activities presented in a way that he experiences "success" repeatedly. This allegedly enhances his self-image and tends to improve his attitude towards study and work. If this vocational activity is obviously connected with the acquisition of marketable skills, the student is presumed to recognize the "dollars and cents" value of the training and accept it more eagerly. Those holding this philosophy contend that remedial programs for disadvantaged youth should place the major emphasis and effort on vocational (industrial) skills.

Other educators believe that the "non-academic" student is so characterized because he never acquired the ability to use communication skills effectively and is deficient in tool subjects such as basic mathematics. No success is possible, it is argued, without first removing the blight resulting from watered-down, unchallenging, and undemanding high school experience. They say that the importance of this remedial activity can be demonstrated to and accepted by the trainees who are mature enough to see the relationships between "success" and, for example, the ability to read with comprehension. Those holding this philosophy contend that training programs for disadvantaged youth should place major emphasis and effort upon development of "academic" skills.

The structure of the Vestibules (Va and Av) reflects these two philosophies, recognizing that there may be merit in both. Thus, type Va stresses vocational training, but devotes some time to the academic subjects; Av does the reverse. As in the case of the other independent variable (duration), it is suspected that differences among students may influence response to these treatments. Variations of response will be explored in the Developmental Phase for possible inclusion during the Experimental Phase (subject to the advice of the evaluation agency).

3. Students completing any one of the four Vestibules will be significantly more successful in the Industrial Technology Curriculum than Control Students.

Comments: The comments of the U.S. Office of Education Review Panel and the experience of the project staff confirm the belief that the purport of this hypothesis has been previously demonstrated.[1] However, much of the work leading to this conviction has been in the form of pilot projects rather than experiments. Since no special data or effort is required to examine this hypothesis, it is clearly advisable to undertake this replication within the present project.

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[1] See footnote reporting U.S. Office of Education Review Panel comments, page 5A-12.

4. Students completing any one of the four Vestibules will be more successful on the job than the Control Students, after both have received Industrial Technology training.

Comments: It is anticipated that the intensive efforts to improve the attitudes of the participants during the Vestibule training will carry over into the employment period. If this is confirmed it may imply that similar techniques should be considered for use in future Industrial Technology programs for students who are admitted *without remediation*.

5. Students who complete the Industrial Technology Curriculum will have more success on the job than students who do not; students who take part of the Curriculum will succeed on the job in proportion to the amount of training they receive.

Comments: The verification of this hypothesis will provide one basis for the evaluation of the Industrial Technology Curriculum. This Curriculum, which is being piloted here, may serve as a model for others in New York City and elsewhere. Therefore, it is important that its effectiveness be determined so as to provide a basis for its continuation or change.

The project staff has sought to design the Industrial Technology Curriculum so that relatively simple vocational elements start at the beginning and become developmentally complex. Validation of hypothesis #5 will confirm that this curricular goal has been met and will help to evaluate the Industrial Technology Curriculum.

6. Subjects who receive OPERATION GIANTSTEP treatment will increase their future time perspective scores significantly.

Comments: The project's population tend to be products of economically and intellectually deprived homes which are often apathetic if not antagonistic towards education. Many of these youths have been permitted to "drift" through high school without clearly defined goals. Many have taken "modified" academic courses but with the important difference that college was not their goal. Many such youths drop out of school; those who graduate have little interest in further education. Implicit in OPERATION GIANTSTEP is that the student, once he has mastered certain useful skills, will feel that the future holds opportunities of gratification for him. Research in time perspective (i.e. the ability for a person to project himself into the future) indicates that self-concept is highly associated with extended future time perspective.

7. Success in *school* (Vestibule Program and Industrial Technology Curriculum) and *on-the-job* is significantly associated with (a composite score of) some attributes and characteristics more than others.

Comments: The exact nature of this variable will be developed in consultation with the evaluation agency. Data accumulated routinely during this experiment will help to identify personal attributes and traits of those most successful in the program. Evaluation of this data may be useful in developing a prognostic instrument that will lead to more efficient training programs by helping to select those most likely to profit from them.

E. Instrumentation and Data

1. General Description

Suitable instruments and procedures will be selected or developed to obtain the data needed to measure the dependent variables. The selection or the design and validation of these instruments and procedures will be undertaken during the Developmental Phase.[1] The data will be coded for storage on punched cards and magnetic tape.

Following are examples of the kind of instruments and data that will be considered and tried during the Developmental Phase:

2. Measuring Before and After Characteristics

a. Achievement Levels in the Basic Scholastic Skills. Under consideration is the Stanford Achievement Test (Reading, Arithmetic Computation, and Arithmetic Applications).

b. An Interest Inventory. Under consideration is the Occupational Interest Inventory (Lee Thorpe) advanced revision 1956. Particular emphasis will be placed on the students interest in technical or mechanical areas.

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[1] Suitability for students from Spanish-speaking environments will be one of the criteria in instrument selection.

c. Mechanical Aptitude. Under consideration is the mechanical comprehension and the spatial relations tests of the Differential Aptitude Test battery.

d. Attitudes. Wallace's "Ten Item Future Time Perspective Test" (1956) will be administered to all students in the project both pre- and post-Vestibule training, pre-employment, and one year after employment.[1] Also under consideration are the Jesnes Inventory and the California Psychological Inventory.

3. Measuring Performance in the Vestibule Program

At the completion of each module, data forms for each student will be completed by the instructor. These forms will record grades on tests and work performed, and graded evaluations of attitudes. The research staff will design and validate these forms and the questions on them during the Developmental Phase. They will also assist instructors to develop objective tests and grading procedures.

Punctuality and attendance records will be kept. A student's length of retention in the program will be an important datum.

Students will be asked to evaluate their own performance in each module. Questionnaires to accomplish this will be developed and validated by the research staff.

Students will not be aware of the grades or evaluations given by the instructors of Vestibule modules. They will receive encouragement and will be advanced into successive modules without regard to the quality of their performance.

4. Measuring Performance in the Industrial Technology Curriculum

Satisfactory completion of the Curriculum and the attainment of the A.A.S. degree will be a major measure of successful performance. The college requires, in addition to completion of content, a minimum grade point index of 2.0 for graduation and degree.

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[1] The test asks the respondent to list any ten events that he thinks will happen to him in the future and indicate at what age he thinks the event will occur. A Future Time Perspective score is the median of all ten projected ages minus the respondent's chronological age.

The Bronx Community College assigns grades of A to F with equivalent numerical values of 4.0 to 0.0.[1] As in the usual college setting, grades will be the perogative of the instructor. However, the research staff will organize seminars to assist the instructors in reviewing effective test construction and evaluation procedures. It is anticipated that one instructor will teach all sections of a particular course. Should this not be possible, instructors will coordinate their teaching and evaluation procedures.

5. Measuring Performance on the Job

Performance on the job will be evaluated in terms of the trainee's ability to obtain, retain, and advance in occupations related to his training. Empirically this will be measured by length of time to find his first job, job title, salary, number and amount of raises, absentee rate, length of time to termination (if pertinent), evaluation by supervisors, and evaluation of the job by the trainee. This same data will be obtained for each subsequent job. The questionnaires used by the supervisor and the trainee will be validated during the period that the Developmental Group is on the job.

Because of the critical relationship between instrumentation and evaluation of data, policies in this area are deferred until an evaluating agency has been chosen.

All regulations pertaining to submission of instruments to the U.S. Office of Education for approval prior to use will be carried out.

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[1] To get a student's scholastic standing the numerical values are weighted by the number of credits in each course and averaged.

SECTION 5B: LOCATION OF SCHOOL

The Bronx Community College is one of the units of the City University of New York, and is also one of the community colleges in the State University of New York.

Its main building is located at 120 East 184th Street, Bronx, New York 10468. It is also using two locations in rented quarters nearby.

In May 1966 the college was authorized to lease a structure within walking distance for use as a "Skill Center." This will house heavy equipment already acquired for Plastics Technology courses, and micro-electronics equipment for which funds have been allocated.

This two-story structure is of heavy construction. It is especially suited for the installation of power tools and similar equipment required for the shops and laboratories of the proposed programs. There is sufficient additional space in this building to accommodate OPERATION GIANTSTEP.

The use of this building for the proposed program is regarded as peculiarly appropriate because the presence and availability of industrial machines required by the other curricula will create an atmosphere conducive to technical learning.

SECTION 5C: PARTICIPANTS

OPERATION GIANTSTEP is intended to assist culturally and economically deprived high school graduates who are likely to become unemployed, underemployed, or employed in jobs with minimum compensation, job security, job satisfaction, and possibilities of growth. While the program is not planned for the exclusive benefit of any ethnic or minority group, criteria for admission to the program and the nature and organization of instruction in the high schools of New York City are such that greater numbers of Negroes and Puerto Ricans are likely to qualify.

1. Criteria for Selection of Students

The following criteria will be used to form a pool of applicants who are representative of the population with which the project is to deal. Individuals to be included in the program are to be selected at random from this pool. Applicants must be:

a. Recent male graduates of any high school, public or private, with a general diploma or its equivalent received not more than three months prior to the start of the program.

b. Ineligible for admission to the Community Colleges of City University as matriculated students because of courses taken or not taken and/or grades earned in high school.

c. Interested in further education and in preparing for technical occupations in industry by virtue of applying to this program.

d. Free from gross medical and/or psychological pathology.

e. A resident of New York City[1] living with at least one parent.[2]

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[1] Bronx Community College is organized to serve on a tuition-free basis only bonafide residents of New York City.

[2] To assure participants with some social stability and the possibility of support during the program.

2. Number of Students to be Selected

a. For the Developmental Phase, approximately 100 students will be selected from a pool of qualified applicants. These 100 students will be used to develop instructional, experimental, and evaluational techniques, so that these may be refined prior to their use in the Vestibules of the Experimental Phase of the project, which starts a year later.

b. For the Experimental Phase, approximately 100 Experimental Students and fifty Control Students will be selected from the pool of applicants. Instructional, experimental, and evaluational techniques perfected during the Developmental Phase will be applied to the Experimental Students.

3. Solicitation of Applicants

Principals of every high school, public and private, in New York City will be advised of the project and supplied with descriptive brochures for distribution to counselors and teachers.

Information releases will be supplied to newspapers, professional journals, and other media of mass and professional communication.

After preliminary publicity, an energetic recruitment campaign will be mounted. Follow-up letters with instructions and application forms will be sent to all New York City high schools. Telephone calls and visits will be made to the high schools in the Bronx, Upper Manhattan, and parts of Queens reasonably accessible to the Bronx Community College by public transportation.

A preliminary survey of selected high school principals has drawn favorable responses and estimates of sizeable numbers of qualified applicants. It is estimated that approximately five hundred (500) completed applications will be received from qualified students.

4. Selection of Sample Forms and Supporting Documents

Submitted application forms and supporting documents will be evaluated for eligibility. The accepted applications will provide the pool from which participants will be selected.

The required number of Experimental Students and Controls will be selected and assigned from this pool by random sampling techniques.

5. Advising the Applicants

All applicants will be advised by June of the year they are scheduled to graduate from high school of the status of their applications. During the summer a number of follow-up letters will be sent to the sample to maintain interest in the program.

6. Entering the Program

Shortly before the start of the program, the sample will be invited to attend one or more testing sessions at which time they will be asked to show proof of graduation.

7. Non-Responders

The records of the non-responders will be compared with the others to determine if there are significant gross differences. Consideration will be given to the feasibility of doing a follow-up aimed at getting more responders or determining the reason for non-response.

SECTION 5D: METHODS AND MATERIALS

Outline

A. Overview of Curriculum Content
B. Scholastic Goals
C. Modular Units
D. Curriculum - Vestibule Period
E. General Description of Courses Offered During the Vestibule Period

   1. Basic Industrial Techniques Laboratory
   2. Basic Mathematics
   3. Communication Skills
   4. Interpersonal Relations
   5. Technical Drawing and Inspection Techniques

F. Curriculum - Industrial Technology
G. General Description of Courses During Year I (IT-1)

   1. Intermediate Industrial Techniques Laboratory
   2. Industrial Graphics
   3. Industrial Organization and Procedures
   4. Applied Mathematics
   5. Applied Science

H. Industrial Technology - Year II
I. General Description of Courses During Year II (IT-2)

   1. Advanced Industrial Techniques Laboratory
   2. Courses in General Education
   3. Counseling and Supportive Services

J. Supportive Services and Other Features

   1. Industry Advisory Council
   2. Large Group Activities
   3. Big Brother Program
   4. Tutor Center and Local Library
   5. Pass-Fail System
   6. Cultural and Extra-Curricular Activities

SECTION 5D: METHODS AND MATERIALS

A. Overview of Curriculum Content

As illustrated in CHART II (Section 1), the industrial technician occupies a status between the craftsman and the engineering technician. In the manufacture of a product, the engineer who heads the research-design-production team is concerned with three major problems: original design, execution of design, and production methods. The *engineering technician* assists the engineer in the execution of the design. The *industrial technician* assists him in the production of the item. While these areas are broad and overlap considerably, this definition of the work responsibilities of the Industrial Technician suggests that the emphasis in the proposed curriculum should be more on industrial methods and production techniques and less upon industrial design. To this end considerable skill-training is included in the three industrial specialties to be offered: electrical, electronic, and mechanical technology. There will be fewer courses in design and engineering drawing than are included in engineering technology programs. It is expected that the industrial technician will be trained to serve in inspectorial, supervisory, or high level trouble-shooting or maintenance capacities in a broad range of industries. As shown in CHART II (Section 1) the "highly-skilled" or industrial technician requires a balanced skill-knowledge "mix" and his training should be job-oriented.

B. Scholastic Goals

One objective of the educational program is to enable students to graduate with the degree of Associate in Applied Science in Industrial Technology. The basic requirements for this degree are established by the Board of Regents of New York State Education Department. At least sixty semester hours, but not more than 120, are required, of which at least twenty must be drawn from the liberal arts and sciences or general education. A minimum of twenty semester hours is required in the area of specialization and related courses. The proposed curriculum meets these requirements. It is planned to provide some recognition of work done by those who cannot meet all degree requirements; being considered is a transcript of record or certificate which will indicate length of time attended and courses completed.

C. Modular Units

Vestibule instruction will not be organized in traditional, semester-length courses but in short self-contained units, each four weeks in length. Since most of these instructional "modules" can be taken in random sequence, considerable administrative flexibility is possible. During the first year of the Industrial Technology Curriculum, the modular structure will be continued but in eight week modules. During the second, or final year, the modules will be sixteen weeks long, or about the same length as ordinary semesters.

The administrative flexibility resulting from the use of modular instruction will enable the college to meet special needs of students. Ultimately, under this system students will be able to enter the Vestibule program at four-week intervals during the year. Modules not needed can be omitted. Students needing to repeat particular units will be able to do so immediately or at a later time. The use of this format of instruction in this project will serve as a pilot toward its possible permanent use at the Bronx Community College or elsewhere. The flexibility possible with this format will not be applied during the Developmental or Experimental Phases of this project but will be deferred until it is a permanent part of the college offerings.

The project staff believes that the possible educational advantages of the flexible application may represent an important contribution. The flexibility features that permit individualized treatment will not be used during this project because of the control requirements of the research. However, experience with modular instruction will provide useful data toward its future application.

D. Curriculum - Vestibule Period

The curricula of the four Vestibules (which vary in duration and instructional emphasis) are given in TABLE VI. The allocation of instructional time is subject to change depending upon conditions which can be determined only after the space available for instruction is known. The general content of individual courses listed is given below. No credit hours are indicated since all Vestibule instruction is regarded as preparatory rather than college-level work.

E. General Description of Courses Offered During the Vestibule Period

1. Basic Industrial Techniques Laboratory[1]

A total of eight four-week modules of instruction is provided for the type 32Va' Vestibule which consists of thirty-two four-day weeks with instructional emphasis upon vocational skill development. Basic industrial skill instruction is given in three broad areas: mechanical, electrical, and electronic production techniques. Some techniques may require more than one module:

Hand Tools and Skills (Bench Operations)
Machine Tool Operations (Heavy Metals, Sheet Metal)
Material Processing (Heat Treatment, Preservation)
Material Fastening (Welding, Riveting, etc.)
Electric Circuits (for Signaling, Light and Power)
Electronics (Assembly, Soldering, Measurement)

For Vestibules in which academic instruction is emphasized (e.g. 32Av') or for the sixteen week Vestibules, the number of modules which can be offered is proportioned to the time available. For example, as indicated in the curricular tabulation, in the 32Va' vestibule, 288 contact hours are provided for laboratory work as compared with 192 for 32Av', and 120 for the 16Av. Thus the number of instructional modules which can be completed for these illustrative cases are *five* for the 32Av' Vestibule, and only *three* for the 16Av'. The particular modules offered, where some must be omitted because of lack of time, are those which are most basic to the three technological specialties.

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[1] Scope of instruction for these and other courses is described in a supplement too large to be included in this Proposal. The Curriculum Supplement contains detailed description of modules, sample lessons and projects, and in some cases day-to-day lesson plans. It is available on call.

TABLE VI

ALLOCATION OF INSTRUCTIONAL TIME VESTIBULE PERIOD - FOUR WEEK MODULES

Type of Vestibule	Subject	Periods Per Day	Days Per Week	No. of Weeks	Contact Hours	Percent of Time
16Va	Basic Indust. Tech. Lab.	3	5	16	240	55.5
	Basic Mathematics	1	5	16	80	18.5
	Communication Skills	1	5	16	80	18.5
	Interpersonal Relations	1	2	16	32	7.5
	TOTAL				432	100.0
16Av	Basic Indust. Tech. Lab.	3	2½	16	120	27.7
	Basic Mathematics	3	2½	16	120	27.7
	Communication Skills	2	5	16	160	37.0
	Interpersonal Relations	1	2	16	32	7.6
	TOTAL				432	100.0
32Va'	Basic Indust. Tech. Lab.	3	3	32	288	41.0
	Basic Mathematics	2	2	32	128	18.2
	Communication Skills	2	2	32	128	18.2
	Tech. Drawing & Insp. Tech.	3	1	32	96	13.6
	Interpersonal Relations	1	1	32	32	4.5
	Elective	1	1	32	32	4.5
	TOTAL				704	100.0
32Av'	Basic Indust. Tech. Lab.	3	2	32	192	27.3
	Basic Mathematics	2½	2	32	160	22.8
	Communication Skills	2	3	32	192	27.3
	Tech. Drawing & Insp. Tech.	3	1	32	96	13.6
	Interpersonal Relations	1	1	32	32	4.5
	Elective	1	1	32	32	4.5
	TOTAL				704	100.0

2. Basic Mathematics

Though remedial in intent, this laboratory- rather than text-centered course is essentially part of the motivational framework intended to capture the interest of the student, whose range of arithmetic retardation may vary between two and four years. The rationale of the course is that calculating machines can be used effectively in instruction of arithmetic processes, and that the development of some skill in their use is both interesting to the student (partly because of the "*pinball effect*") and of some vocational value. Student interest in calculating machines is further exploited by having him *construct* simple calculating devices himself, using completed devices for basic operations, and checking the results on commercial calculators of various types which would be available in the classroom. A maximum of eight modules in mathematics, with a total of 160 hours of instruction, is provided for the 32Av' Vestibule. These modules involve both instruction in and construction of the following devices and instruments. Some units require more than one modules:

Calculation with the Oriental Abacus
Calculation with Napier's "Bones"
Calculation with Slide Rules
Calculation with Stepped Wheel Devices
Calculation with Elementary Digital and Analog Computers

As with the Industrial Techniques Laboratories, the number of modules in mathematics which can be completed by a student depends upon the Vestibule to which he has been assigned. In Basic Mathematics the maximum time allocation is 160 contact hours (in the 32Av' Vestibule) for eight modules. Since only eighty contact hours are available in the 16Va, only four modules can be given to students in this Vestibule.

3. Communication Skills

The communications skills modules will require relatively hard work which (once the student recognizes the "down-to-earth," practical "bread and butter" value of the courses) will serve to motivate rather than to repel him.

Accordingly, the modules involve colorful content and utilize innovative techniques and fresh approaches (i.e., programed instruction, reading laboratory kits, audio visual equipment, kinescopes), but the aims of instruction are traditional. The student must sharply increase his ability to read, write, and speak effectively; be up-to-date and unencumbered in matters of usage, pronunciation, vocabulary, etc. Drill is needed to master such skills, and the shorter the Vestibule to which a student is assigned, the more crucial the drill is.

The full course in Communications Skills consists of eight four-week modules, five of which are "Basic" and three "Cultural" or "horizon-Stretching." The first five focus on critical and fundamental skills in the language arts:

a. reading speed and comprehension;
b. vocabulary growth;
c. social and vocational speech skills;
d. expository and descriptive writing;
e. standards for correct usage in spelling, grammar, letter forms, etc.

The remaining three modules contribute generally to language skills but have as their chief aim to enrich and broaden cultural and communications horizons:

f. language sophistication (critical thinking, semantics, and expediting clear communication)
g. an exploration of mass media;
h. a cultural omnibus (a sampling of music art, dance, architecture and *what* and *how* they communicate).

The eight modules interrelate in many mutually-supporting ways. The topics only hint at the scope, suggested texts, and specific activities. These, together with more detailed descriptions of the modules and a sampling of lessons and exercises are available in a curricular supplement too large to be included in this proposal, but available on call.

The number of modules allocated for Communications Skills in any Vestibule depends on the number of contact hours available, to the maximum of 192 for 32Av'. Students in Vestibule 32Av' receive all eight modules, while those in 16Va have time for only three. Which ones will be used, or whether fractional parts of some modules will be used, are questions to be resolved during the first, or Developmental Phase of the program.

4. Interpersonal Relations

The purpose of this course, which all Vestibule students will receive to an equal though modest extent (thirty-two contact hours), is to help participants adjust to a college environment, smooth problems while they remain in college, and make the transition after they leave. The content of the course has elements of mental hygiene as well as relevant psychological and sociological information. The content will stimulate discussion of broad problems, expose misinformation and misconceptions. The scope of the units is suggested by the following enumeration of topics.

Succeeding in college
Career planning
Working cooperatively in joint projects
Understanding and improving racial relations
Coping with urban problems
Assuming adult responsibilities
Evaluating educational experience

Most of the topics are non-sequential, so that the order in which they are given is optional.

5. Technical Drawing and Inspection Techniques

A technician cannot succeed without the ability to interpret technological drawings. The traditional method of teaching students to read mechanical drawings (or blueprints) is to have them *make* such drawings. But the industrial technician is not required to be skilled in design and accordingly need not be skilled in the preparation of engineering drawings. It is more important for him, rather, to be able to interpret such drawings readily. In order to do this, a series of mechanical drawings representing objects of increasing complexity will be prepared for the student. The actual objects represented by the drawings will have been made up in advance. These objects will be faulty in one or more particulars in that they do not conform exactly to what is represented in the drawing. Students will be taught to make measurements on these parts and check the measurements against what is specified in the drawings. In order to do such checking, which corresponds to the work of an inspector, students will be required to learn how to use instruments such as micrometers, vernier calibers, protractors, thread guage, go/no/go gauges, and the like. The student will be rated according to the speed with which he works and the number of technical flaws he detects in the object he is inspecting and comparing with its blueprint.[1]

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[1] This course is given only during the 32-week Vestibules.

F. Curriculum - Industrial Technology

The content of the first year of the two-year Industrial Technology Curriculum is indicated in TABLE VII, that of the second is given in TABLE VIII. Unlike the Vestibule period, which is given at a pre-college level, the Industrial Technology Curriculum is made up of courses which carry academic credit towards the A.A.S. degree. Requirements for the degree include courses in general (liberal arts) education. These are usually the ones which cause general course students the greatest difficulty, so these subjects are deferred until the second college year. This delay will permit the student to gain in maturity, motivation, and to complete specific remedial work so as to improve his chances for ultimate success.

Instruction during the first year is divided into four eight-week modules, each approximately half the length of an ordinary 15-week semester including examinations. Instruction during the second year is divided into two sixteen-week modules, each approximately the same length as an ordinary semester.

Unlike the preparatory period during which the number of contact hours of instruction a student receives depends upon the Vestibule to which he is assigned, each student now spends the same time in each course as all other students.

Each student spends approximately half his instructional time (three periods per day) in the Industrial Techniques Laboratory (or Shop). Of this time, approximately one-third (one period per day) is devoted to demonstrations by the instructor and to instruction in industrial procedures and practices and the principles underlying them. Students spend the remaining time in pertinent manipulative and similar skill-developing activities under the direction of the instructor.

G. General Description of Courses During Year I (IT-1)

1. Intermediate Industrial Techniques Laboratory

Of the four eight-week modules available, students spend two in Mechanical Technology and one each in Electrical and Electronic Technology. The skills to be developed are as follows:

a. Mechanical Technology

The student develops skills in the operation of machine tools such as lathes, milling machines, shapers. He

TABLE VII

ALLOCATION OF INSTRUCTIONAL TIME
INDUSTRIAL TECHNOLOGY - YEAR I - FOUR 8-WEEK MODULES

Subject	Periods Per Day	Days Per Week	No. of Weeks	Contact Hours	Equivalent Semester Hours[1]
Intermediate Industrial Techniques Laboratory					
Mechanical Tech.	3	5	16	240	5
Electrical Tech.	3	5	8	120	2.5
Electronic Tech.	3	5	8	120	2.5
Ind. Graphics	2	3	16	96	2
Ind. Organization and Procedures	2	3	16	96	6
Applied Mathematics	1	5	32	160	10
Applied Science	1	4	32	128	8
TOTAL...............................				960	36

[1] Sixteen hours of instruction (including examinations) is defined as being equal to one semester hour for a prepared subject and forty-eight hours for an unprepared subject.

SUGGESTED COURSE AND SEMESTER CREDIT HOUR REQUIREMENTS FOR JUNIOR COLLEGE CURRICULUMS FOR HIGHLY SKILLED (INDUSTRIAL) TECHNICIANS

Divisions of the Curriculum and Suggested Courses	Semester Credit Hour Requirements (One credit for one lecture hour or for three lab hours)	
	Credit Hours	Percent of Total
Mathematics—a one-year technical math course covering advanced arithmetic, algebra, geometry, trigonometry, and slide rule	6	8
Applied science—technical physics or technical chemistry	8	11
Technical specialty courses basic to the student's major—some theory, but emphasis on practice	36	49
Supporting technical courses—drafting, general shop, etc.	9	12
General education courses—English, humanities, social studies	15	20
TOTAL	74	100

Chart VII - Basis of Two-year Industrial Technology Curriculum which follows post high school, pre-college training period (or vestibules). To be modified as required locally. See Text.

Adapted from: HARRIS
Norman C. [redacted], *Technical Education in the Junior College/New Programs for New Jobs*. American Association of Junior Colleges, Washington,D.C. 1964. Used with permission.

learns welding and brazing techniques, layout and fabrication of sheet metal, and the use of gauges and other measuring devices.

b. Electrical Technology

The student develops skill in bending and installing conduit, wiring for power and lighting, electric motor starters, motor maintenance procedures, electrical communications, electrical meters and measurement, and trouble-shooting techniques.

c. Electronic Technology

The student develops skill in assembly techniques including preparation of simple printed circuit boards. He also studies electronic meters and measurements, and learns trouble-shooting techniques.

2. Industrial Graphics

A basic course in technical drawing with particular stress upon interpretation of such drawings and the preparation of free-hand sketches and simple drawings requiring the use of elementary drawing tools. In addition to studying mechanical drawings, students will learn wiring and schematic diagrams applicable to electric power, communications, and electronic circuits. The drawings used for instruction will be applied to work done in the Industrial Techniques Laboratory.

3. Industrial Organization and Procedures

A survey course including mass production techniques, automated procedures, inspection techniques and quality control, industrial maintenance and trouble-shooting techniques. Visits to manufacturing plants will be scheduled. Instruction is to be correlated wherever possible with work in the Industrial Techniques Laboratories. Industrial and Labor Relations information will be included.

4. Applied Mathematics

A one year technical mathematics course covering advanced arithmetic, basic algebra, elements of geometry and trigonometry, use of the slide rule, and advanced techniques in the use of calculating machines. The work will be related to activities in the Industrial Techniques Laboratory whenever possible.

5. Applied Science

Those elements of physical or chemical science most useful in understanding the operation of mechanical devices or operations, and basic electrical or electronic circuits. Instruction will be correlated with activities in the Industrial Techniques Laboratory whenever possible and will contain a maximum of demonstrations using visual aid equipment.

H. Industrial Technology - Year II

In his second college year, the student spends three periods per day in the Advanced Industrial Techniques Laboratory and the balance of his time taking required and elective courses in General Education to satisfy the requirements of the A.A.S. degree.

The non-laboratory courses are taken as part of the regular offerings of the college and, unlike the courses described above, are given by regular college staff rather than special project staff. Second year Industrial Technology courses, including laboratories, are planned to be given in the main building of the college rather than in the "Skill Center" or other leased extra-mural quarters.

TABLE VIII

ALLOCATION OF INSTRUCTIONAL TIME
INDUSTRIAL TECHNOLOGY - YEAR II - TWO 16-WEEK MODULES

Subject	Periods Per Day	Days Per Week	No. of Weeks	Contact Hours	Equivalent Semester Hours
Adv. Ind. Tech. Labs.					
Mechanical Tech.	3	5	16	240	5
*Electrical Tech.	3	5	16	240	5
Courses in General Education					
English	-	-	-	-	6
Mathematics	-	-	-	-	5
Physics	-	-	-	-	5
Social Studies	-	-	-	-	6
Health Education	-	-	-	-	2
Total - Year II					34
Total - Year I					36
Grand Total (not including Vestibule)					70

*Electrical and Electronic Technology combined.

I. General Description of Courses During Year II (IT-2)

1. Advanced Industrial Techniques Laboratory

The spiral method of instruction is applied so that the same skills introduced in the first year are extended and strengthened. Of the two sixteen-week modules, one is devoted to instruction in mechanical technology; the other to a combination of Electrical and Electronic Technology. The exact content of courses is not determined at this time because it is uncertain whether physical space will be available in the main building for this purpose some three years hence. A building expansion program is contemplated. Should it be completed, even in part, it will be possible to offer such desirable instruction as numerical control of machine tools, advanced instrumentation, measurement and testing of electrical power, and communication circuits.

2. Courses in General Education

These are regular courses listed in the college catalog and offered by various departments of the college. The exact numbers and titles of the courses will be recommended by an appropriate faculty committee.

3. Counseling and Supportive Services

a. Group Counseling

All students will be scheduled to meet at least once a week in groups of ten (or fifteen at the most) to discuss, under the direction of a guidance specialist, problems in classroom instruction or other matters pertaining to adjustment and to obtaining the maximum benefit from the Vestibule Program. The group atmosphere encourages free discussion, since many of the problems are shared by the participants. Emphasis is not on uncovering deep personal problems, but rather on airing attitudes toward school activities, financial problems, vocational goals, family relations and the like. When properly conducted, such group counseling enables students to learn tolerance for each other, increase their own self-confidence, and improve in their ability to communicate.

Because spontaneity is an important element in the success of this activity, the content of the discussions cannot be specified in advance. Instead much depends upon the skill of the guidance specialist and his experience (1) in conducting meaningful and effective group sessions with young men of this age group; (2) in eliciting expressions of attitudes influencing the participants and exploring them carefully; and (3) in improving the self-image of the participants. To achieve the foregoing, those selected as guidance specialists must have sound and thorough grounding in psychological-sociological (psychosocial) problems for this age group.

b. Guidance - Instructional Staff Liaison

Guidance specialists will meet at bi-weekly intervals with each instructor individually and with the teaching staff as a whole in order to feed back to them developments in group and individual meetings and to learn of students' progress and problems.

c. Guidance Meetings with Individual Students

Appointments with individual students will be scheduled at the beginning and at the end of each 16 week period (corresponding to the usual semester). The first meeting will afford the student an opportunity to discuss immediate problems and gain information about his program. The one at the end will help the student evaluate his performance and to receive help in his future planning.

The above schedule represents a minimum program. Experience during the Developmental Phase will indicate whether it is adequate. It may well be, for example, that an individual guidance meeting at the beginning of each four week period is desirable. This would substantially increase the number of meetings required. The Guidance Specialists' activities are intended to help the students recognize achievements, as well as problems, and are to be coordinated wherever possible with the total school program.

J. Supportive Services and Other Features

1. Industry Advisory Council

In any program seeking to train Industrial Technicians to serve the needs of industry, it is evident that representatives of industry should participate and advise in recommending practices and procedures, suggesting modifications, and offering counsel in the operation of the program. To this end, an Advisory Council, whose members are to be drawn from representative industries and organized in suitable sub-committees, is to be set up early in the project.

2. Large Group Activities

The schedule will be organized so that students will have no formal classes on one morning and one afternoon of different days each week. This arrangement will facilitate large group activities such as films and guest lectures. Visits to local industries by student groups and cultural activities will be scheduled with the cooperation of the Advisory Council. Non-class time during each day will be useful for other purposes such as study activities and consultation with instructors, counselors, and faculty advisors.

3. Big Brother Program

Entrance into college is often a confusing and anxious time for students admitted to traditional curricula. It is likely to prove even more troublesome for the marginal student. In addition to guidance and counseling services, OPERATION GIANTSTEP includes a Big Brother Program, under which each new student is teamed with a more experienced student. The new student would be required to spend at least an hour a day for the first modular period in the Tutor Center with his Big Brother. The Big Brother would assist the student with his studies, answer his questions, and in general, serve to support and guide him during the introductory period. The psychological advantages to the Big Brother himself may prove to be as valuable as those to the new student. Since students in the program are likely to be disadvantaged, it is hoped that service as Big Brothers may be accepted as a work-study activity under which they may qualify for assistance under the Economic Opportunity Act. The availability of such financial help may play an important part in enabling needy students to remain in school.[1]

4. Tutor Center and Local Library

One of the planned innovations of OPERATION GIANTSTEP is the Tutor Center to which students will be regularly scheduled but to which they may go at other times as well. It will be open and staffed both during the day, evenings, and Saturdays. The Tutor Center will contain teaching machines with a wide variety of programed instruction, remedial and otherwise, and a collection of programed textbooks. With this material, the student will be enabled to remedy deficiencies or explore new interests. In addition to teaching machines and books, the Center will be staffed with personnel qualified to give individual instruction or tutoring when required, to answer questions, to provide direction, and make referrals to counselors or advisors in case of special problems. The Tutor Center will be provided with sound-absorbent study booths so that tutoring by staff members, student aides, or Big Brothers may be carried on without mutual interference. Facilities for individual study and a suitable reference library will be available.

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[1] The possibility that the Big Brother program may interfere with the research will be explored before it is used in this project.

The Tutor Center will not replace the main college library. The Industrial Technology students will be encouraged through their course assignments to use the traditional college library.

5. Pass-Fail System

Since the student is in need of maximum support and encouragement during his first contacts with the program when his work may be marginal, though acceptable, he will be told by the instructor only that his work is satisfactory. Instructors will be asked to give more revealing rating on a confidential basis for purposes of evaluating the instruction and possibly modifying it as required prior to the start of the Experimental Phase. Conventional grades will be used during the Industrial Technology sequence.

6. Cultural and Extra-Curricular Activities

Humanities and cultural subjects are part of the general education courses in the Industrial Technology curriculum. Some OPERATION GIANTSTEP students may need special motivation and effort to attain an appreciation of culture. To this end, a program of cultural activities will be planned for half-days (during which the student has no classes scheduled). Included will be presentations of music, dance, and drama. Art exhibits with special emphasis on the use of art in industrial design will be arranged. All this would be coordinated with the existing rich program of the Bronx Community College.

Competitive and recreational sports will be provided on an informal or intra-mural basis. Students will be encouraged to make use of facilities available in the Main Building such as the gymnasium and swimming pool.

SECTION 5E: EVALUATION

The evaluation of this project will be sub-contracted to a qualified agency. Negotiations have been started with the Center for Urban Education (32 West 42nd Street, New York City, 10036) and with the Center for Field Research and School Services of New York University (Washington Square, New York, N.Y. 10003). Both of these agencies have made written commitments to provide the required evaluation should they be selected.

The evaluation agency will be responsible for the selection, development, and validation of all instruments and data gathering procedures. They will cooperate with the College to develop a suitable data processing system and monitor the data handling and processing both by the college and its own staff.

The evaluation agency will concern itself with two related problems: the research objectives of OPERATION GIANTSTEP and a determination of the efficacy of the two new educational programs (Vestibule and College). The two aspects of OPERATION GIANTSTEP, research and development, interrelate.

SECTION 5F: TIME SCHEDULE

The proposed time schedule for this project is illustrated diagramatically in CHART IV in Section 5A.

1. Administrative and Follow-up

a. February 1, 1967. Key personnel engaged for tooling-up and recruiting staff and students.

b. June 1971. Last experimental students graduate. Final report starts.

c. July 1972. Follow-up of last graduates ends. (A one-year "on-the-job" follow-up period starts whenever an enrolled student leaves the program.)

d. August 1972. Final Report completed - Project ends.

2. Schedule for Instruction

a. September 1, 1967. Start Developmental Phase (Phase I) with 100 students.

b. February 1, 1968. Start first Industrial Technology sequence (IT-1A, IT-B, etc.) with Phase I students completing 16-week Vestibules.

c. September 1, 1968. Start second Industrial Technology sequence (IT-1A_2, etc.) with Phase I students completing 32-week Vestibules; also start Experimental Phase (Phase 2) with 100 Experimental Students entering the Vestibules and 50 Control Students entering the second Industrial Technology sequence IT-1A_2, IT-1B_2, etc.).

d. February 1, 1969. Start the third Industrial Technology sequence (IT-1A_3, IT-1B_3, etc.) with Phase 2 students completing 16-week Vestibules.

e. September 1, 1969. Start the fourth Industrial Technology sequence (IT-1A_4, IT-1B_4, etc.) with Phase 2 students.

f. February 1, 1970. Graduation with A.A.S. degree in Industrial Technology of successful Phase I students who entered 16-week Vestibules in September 1967.

g. June 30, 1970. Same as February 1970 but for students completing second Industrial Technology sequence, and who entered the Second Industrial Technology sequence in September 1968.

h. February 1, 1971. Same as February 1970 but for students completing third Industrial Technology sequence.

i. June 30, 1971. Same as February 1970 but for students completing fourth Industrial Technology sequence.

SECTION 6: DISSEMINATION

A. Reports

The results of the development and research efforts of OPERATION GIANTSTEP will be discussed in a series of reports. It is anticipated that these reports will include:

1. Description of the Vestibule Program. Part of this report will be a detailed curricular manual. Special attention will be given to the features that are innovative or not well known, such as the modular organization. Evaluation and suggestions for further development and experimentation will also be included.

2. Description of the Industrial Technology Curriculum. This report will be similar in content and form to that for the Vestibule Program.

3. Description of the research. This report will provide sufficient detail about purposes, procedures, and evaluation so that it may serve as a basis for further research and analysis. Five hundred copies of these and other reports deemed appropriate will be duplicated. Their availability will be announced through publicity releases and publications such as the *Reporter:* Clearing House of Studies on Higher Education of the U.S. Office of Education. Copies will be distributed free of charge as long as the supply lasts.

B. Articles in Periodicals

The personnel of the project will prepare abstracts and articles for publication in educational journals.

C. Conferences and Professional Meetings

The personnel of the project are regularly involved as speakers and panelists at meetings of professional societies. This project will be a suitable topic for their presentations and disucssions during its progress and after its completion.

D. Permanent Establishment of Programs

It is anticipated that as the various parts of the project are completed that the Vestibule Program and the Industrial Technology Curriculum will become permanent offerings at the Bronx Community College. These programs will be available for inspection by educators and other interested persons.

SECTION 7: PERSONNEL

A. Original Industrial Technology Planning Team

1. **Morris Meister, Ph.D.**, founding President (1958) of the Bronx Community College of the City University of New York. Founding principal and head for twenty years (1938-58) of the nationally-renowned Bronx High School of Science. Director of the Pre-College Enrichment Program ("Operation Second Chance") 1959-62.

President Meister has given many decades of leadership and active contribution to civil and educational projects, especially in science education, and education for the gifted, culturally disadvantaged, or deprived.[2]

2. **Manuel Stillerman, M.S., P.E.** Since 1958, Head of the Department of Engineering Technologies (Mechanical and Electrical) of the Bronx Community College of the City University of New York; recently designated Director of the Evening and Extension Division; originated the idea for OPERATION GIANTSTEP; was designated Fellow in Academic Administration by the American Council in Education and served an internship under President William Hagerty of the Drexel Institute of Technology, 1965-1966. Licensed professional engineer; broad experience in industry as an electrical and mechanical engineer with a number of national companies; contributor to projects in vocational education (e.g. Programed Instruction Project, N.Y. Academy of Science Transactions, June 1963).

3. **Milton Lowens, E.E., M.A., P.E.** Since 1948, Chairman of Department of Applied Electricity and Related Technical Subjects in the Samuel Gompers Vocational and Technical High School, Bronx, New York. Licensed professional engineer with broad experience in electrical power plant design, field supervision of large electrical installations. Part-time lecturer in the Bronx Community College of the City University of New York in the Electrical Engineering Technology Curriculum. Editor and Senior Instruction Book Writer in plant of prime contractor

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[1] Dr. Meister will retire as President of Bronx Community College as of September 1966 but has pledged his continued active support.

producing classified electronic equipment for U.S. Navy during World War II. Author of *Basic Applied Science*, a teacher's manual (State Education Department 1952), and of several articles in professional journals on vocational education. Awarded a National Science Foundation Grant in 1964 to study Nuclear Physics at Columbia University.

4. **Abraham Tauber**, Ph.D., Dean of Faculty (1958-1966) and Dean-in-Charge (February through June 1966) of Bronx Community College of the City University of New York (formerly head of Department of English and Speech). Educational Consultant and co-director of Pre-College Enrichment Studies Program; author (with Morris Meister of "Operation Second Chance," in the *Junior College Journal*, October 1962, and "Experiments in Expanding Educational Opportunity for the Disadvantaged," in the *Phi Delta Kappan*, March 1965. Formerly member of the faculty of City College of New York and the Bronx High School of Science; Director of Speech Center 92nd Street YMHA; Visiting Professor at Yeshiva College of Yeshiva University; moderator, speaker, panelist, New York State Association of Junior Colleges.

5. **Samuel S. Schoenfeld**, M.S., Consultant in Technical Subjects. Broad industrial experience in electrical engineering. Teacher of Applied Electricity at the Samuel Gompers Vocational and Technical High School since 1941; Acting Chairman of the Technical Department since 1961. Part-time lecturer in Electrical Engineering Technology Department of the Bronx Community College of the City University of New York. National Science Foundation study awards in 1961 and 1964,

6. **Robert M. Hecht**, B.B.A., Consultant in Testing, Guidance and Advisement. President, Personnel Testing Service; formerly Executive Vice-President of the Personnel Psychology Center, and former faculty member at City College of New York and Bronx Community College. Has done research for the Ford Foundation on developing educational potential among the culturally deprived.

7. **Sidney Lirtzman**, Ph.D., Consultant to Personnel Testing Service, Inc. Currently Director of Social Science Research for Computech, Inc. Formerly associated with the Veterans' Administration; a Vice-President of Ted Bates & Co., and Vice-President of Nowland & Co. Has twelve years of experience in large-scale statistical analysis of research data.

8. **Paul Rosenfeld**, M.S., Consultant in Budget, Administration, and Organization. Assistant to the Dean of Administration, Bronx Community College.

9. Gerald E. Ottoson, M.S., Consultant in Relationships with Industry. Director of Placement with the Allied Chemical Corporation. Previous experience as a Director of Industrial Relations in the Solvay Process Division. Supervisor of Adult Industrial Education in the State Education Department. Design Engineer, Municipal Engineer. Instructor in Technical Education in the Jamestown Technical High School. Knowledgeable in the employment practices of large corporations.

B. Staff and Consultants (Educational and Research Specialists) Added During ERD-553 (2/1 Through 8/31/66)

1. Irwin Berger, Ph.D., Educational and editorial consultant. Assistant Professor of English at Bronx Community College. Prepared the new Communications Skills courses. Edited the manuscript, and assisted in clarifying the structure and wording of this proposal. Formerly Language Arts Curriculum Specialist at the Bureau of Curriculum Research, Board of Education (NYC), and Acting Chairman, English Department, Evander Childs High School, Bronx, N.Y.

2. Sidney Silverman, Ed.D., Budget Consultant. Dean of Administration, Bronx Community College of the City University of New York.

3. Gerald R. Ehrlich, Ph.D. Assisted in preparation of the Research Plan. Associate Professor, Department of Student Personnel, Bronx Community College. New York State Certified Psychologist; formerly Project Director, "Restoration of Youth through Training," a research project funded under provisions of Title I of P.L. 87-415. Also Acting Director, Research and Planning, Department of Correction, City of New York.

4. Leonard J. Tinkel, B.S. in E.E., M.A. Assisted in the preparation of curricular materials for new courses in Applied Mathematics and Applied Science. Chairman of Related Technical Subjects Department, George Westinghouse Vocational-Technical High School, Brooklyn, N.Y.

5. Marvin Sicherman, M.S.W. Prepared Guidance and Counseling procedures. Director, Stanley M. Isaacs Neighborhood Center (deprived area, NYC). Previously Branch Director, Mobilization for Youth; Trainer of Peace Corps Volunteers (India); formerly Fulbright Fellow (India); Family Counselor; Caseworker; Administrator of Tutorial Program for deprived youth, etc.

7. Stanley Einstein, Ph.D. Assisted in preparation of the Research Plan. Staff Psychologist, Flower-Fifth Avenue Hospital, N.Y. Chief Editor, *International Journal of Addictions*. Also has had extensive experience in working with delinquent members of disadvantaged youth, both as a practicing psychologist and in preparing and executing research proposals funded by Federal, State and other governments.

C. Additional Advisors

1. Raymond Weiss, Ph.D., Professor of Education, New York University. Supervisor of doctoral research in the School of Education for the past 15 years. Teaches "Methods of Educational Research" to doctoral students in NYU. Director of Evaluation for "Occupational Training Program for school-alienated youth of Norwalk, Connecticut.

2. Harry E. Wolfson, Ph.D., Assistant Superintendent, Board of Education of the City of New York. Formerly (prior to reorganization of entire administrative structure of the Board) in charge of the Vocational High School Division. Now in charge of Instruction and Curriculum Development for the high schools.

3. Seelig L. Lester, Ph.D., Assistant Superintendent, Board of Education of the City of New York. Formerly Director of Related Technical Subjects, Vocational High School Division. Also formerly Principal, Samuel Gompers Vocational-Technical High School; Bronx, New York.

4. Charles M. Shapp, Ph.D., Assistant Superintendent, Board of Education of the City of New York. Formerly teacher and principal in deprived neighborhoods of both elementary and junior high schools. Prolific writer of educational books and articles with special emphasis on problems of educating the disadvantaged.

5. Kenneth B. Clark, Ph.D., Chief Project Consultant HARYOU, Professor of Psychology, City College of New York.

6. Edmund Gordon, Ph.D., Professor of Psychology, Yeshiva University. National Director of Research, "Head Start" Project.

SECTION 8: FACILITIES

A. Existing Facilities

The Bronx Community College is housed in a five-story building of approximately 147,000 square feet. Formerly the home of the Bronx High School of Science, the building was completely renovated and re-equipped at a cost of approximately 2.75 million dollars between 1961 and 1963. Its present laboratory facilities, especially for engineering technology courses, are regarded as outstanding.

This main building of the college contains a number of laboratories which (based on existing enrollments) will be available for some use in the Vestibule program and considerable use in the two-year Industrial Technology Curriculum.

B. Future Facilities

The Bronx Community College is in the process of building a new campus to accommodate 4800 students. The new campus should be available before the (first) Experimental Phase is completed. At the new campus, there will be adequate space to accommodate all the requirements of OPERATION GIANTSTEP.

C. Facilities to be Acquired

The college is committed to the operation of a Skills Center to accommodate new programs in Plastics Technology and Micro-Electronics. The college is negotiating for the rental of two floors of a nearby building (rental approved July 1966 by the New York City Board of Estimate). A third floor in this building is available for use by OPERATION GIANTSTEP.

D. Integration with Bronx Community College

The organization, administration, and utilization of project facilities will be coordinated with the existing facilities of the Bronx Community College. This coordination will help to provide a feeling of belonging to the students in this program, and help them to relate to existing college programs.

Any space rented for this OPERATION GIANTSTEP will be pooled with the total college's facilities. Students in the permanent curricula will attend some classes in the OPERATION GIANTSTEP center and OPERATION GIANTSTEP students will have some of their classes and laboratories at the main campus. General college facilities will be available to OPERATION GIANTSTEP students: the auditorium, cafeteria, student lounge, library, gymnasium, swimming pool, etc.

SECTION 9: OTHER INFORMATION

A. Support of Proposed Project by Others

There is no support available for the purpose of carrying out this project aside from the partial funds the Bronx Community College will provide.

B. Submission of Proposal to Others

This proposal has not been submitted to any agency other than the U.S. Office of Education.

C. Program Extension

This program is a proposed addition to a program currently (until August 31, 1966) supported by the Office of Education. See Item D. below.

D. Previous Submissions of Proposal to the U.S. Office of Education

The earlier proposal, titled OPERATION GIANT STEP, was submitted to the Office of Education on May 20, 1965. Its purpose (a Pilot Program) and emphasis (vocational Training of disadvantaged youths as industrial technicians by modular instruction at a community college), were different from those of the present proposal, which includes a research design.

To implement this desired change in orientation, OPERATION GIANT STEP was conditionally approved by the Office of Education as Project ERD-553 and funded (2/1/66 through 8/31/66) in the amount of $49,357 so that staff could be employed and consultants engaged to produce a new proposal for the Operational Phase of the project whose purpose now includes research in factors that influence success in remedial programs as well as the development of two related educational programs for disadvantaged youth.

SECTION 10: SUPPORT OF PROPOSAL BY OFFICIALS AND AGENCIES

Summary

This section demonstrates exceptionally strong support of the proposed project by officials of the New York State Education Department and others. Copies of letters are included as well as quotations from knowledgable State and City educational officials ranging from the Commissioner of Education to principals of high schools.

Outline

A. Support by New York State Education Department

1. Dr. James E. Allen, Jr.
2. Dr. Alan G. Robertson

B. Support by Other New York State Officials

1. Mr. William N. Fenninger
2. Dr. Dorothy M. Knoell
3. Dr. Norman D. Kurland
4. Dr. William A. Lyons
5. Dr. Charles Pearce

C. Support by New York City Officials and Agencies

1. The Board of Higher Education
2. Dr. Albert H. Bowker
3. Center for Urban Education
4. New York University (School of Education)
5. Dr. Bernard E. Donovan
6. Dr. Seelig L. Lester
7. Dr. Harry E. Wolfson
8. Dr. Charles M. Shapp
9. Mr. Daniel P. Marshall
10. Dr. Bernard Weiss
11. Dr. Paul Schweitzer
12. Dr. Joshua Segal

SECTION 10: SUPPORT OF PROPOSAL BY OFFICIALS AND AGENCIES

A. Support by New York State Education Department

1. Dr. James E. Allen, Jr., Commissioner of Education of the State of New York, in a letter dated May 27, 1965 to the Honorable Francis Keppel, then Commissioner of Education, U.S. Office of Education, stated that OPERATION GIANTSTEP had his "strong endorsement." He expressed his hope that it would receive "approval and support" under the Vocational Education Act of 1963. (On file in U.S. Office of Education.)

2. Dr. Alan G. Robertson, Chief, Bureau of Occupational Education Research of the New York State Education Department advises in his letter of June 10, 1966 that the letter of approval described above is still valid. Dr. Robertson has been in touch with the program from its inception; it has his enthusiastic support.

B. Support by Other New York State Officials

1. At the suggestion of the New York State Department of Education, OPERATION GIANTSTEP was discussed with Mr. William N. Fenninger, Executive Secretary of the American Technical Education Association, Inc. In a letter dated April 1, 1965 Mr. Fenninger said: "We will be pleased to cooperate with you if your proposal . . . is approved. . . . We need to know more about how to serve youth that come out of high school without the qualifications necessary for admission to programs of engineering technology. . . ."

2. Dr. Dorothy M. Knoell, Urban College Study, State University of New York, has stated in a letter dated March 14, 1966 that the proposed project "is extremely promising as a model for other occupational areas and for other colleges."

3. Dr. Norman D. Kurland, Director, Center on Innovation in Education, University of the State of New York, in a letter dated April 27, 1966 said that

"[OPERATION GIANTSTEP] looks like a very promisng project and we shall watch its development with great interest."

4. Dr. William A. Lyons, Director of the College Proficiency and Examination Program of the Office of the Assistant Commissioner of Higher Education of the State Education Department, has expressed the following with respect to this program: "Your modular approach for students in an industrial technology program sounds most exciting and innovative, particularly those aspects of it that have to do with providing some kind of remedial work to students who must be raised to the level of the normal entering student in such a program. We need more of that kind of thing."

5. Dr. Charles Pearce, Director of the Division of Research and Statistics of the New York State Department of Labor, and two members of his staff, Mr. Loeb and Mr. Bernstein, conferred with project personnel. Dr. Pearce stated that he felt that the proposed Industrial Technology curriculum would meet the requirements of employers for industrial technicians in the New York State area. His comments are particularly pertinent, since his department recently completed a comprehensive survey of occupational conditions and projections in engineering-related occupations at the subprofessional level in the New York State area.[1]

C. Support by New York City Officials and Agencies

1. The Board of Higher Education of the City of New York gave the proposal their support and approval after it was submitted to them by Bronx Community College President Morris Meister on May 17, 1965.

2. Dr. Albert H. Bowker, Chancellor of the City University of New York, in a letter to President Meister dated May 17, 1965, stated as follows: "As chief officer of the City University of New York, I give my full approval and support for the request for a grant under Section 4(c) of Public Law 88-210, the Vocational Education Act of 1963." (Copy of letter on page 10-7.)

3. Center for Urban Education. In a letter dated June 28, 1966, Dr. Nathan Brown, Associate Director of the regional educational laboratory (the evaluating agency of all the projects being conducted by the New York

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[1] New York State, Department of Labor, Division of Research and Statistics. *Technical Manpower in New York State*. Special Bulleting 239, Volume I, December 1964, pp. 24, 28-30.

City Board of Education under Title I of the Elementary and Secondary Education Act) said: ". . . we are interested in the objectives of this research and demonstration program (OPERATION GIANTSTEP) . . . [and] are very much interested in [its] outcomes. . . . You may count on our cooperation in an evaluation research study [and] may [so] advise the U.S. Office of Education. . . ."

4. New York University (School of Education). In a letter of intent dated July 1, 1966, Dr. Lou Kleinman, Director of the University's Center for Field Research and School Services, offered ". . . the consultative assistance of appropriate specialists in the areas of training, research and evaluation when [OPERATION GIANTSTEP] becomes operational . . ."

5. Dr. Bernard E. Donovan, Superintendent of Schools of the City of New York acknowledged need for and expressed approval of post-high school vocational training programs such as OPERATION GIANTSTEP. Dr. Donovan is cited by Chancellor Bowker in a letter dated May 17, 1965 (see p. 10-7) in which Dr. Bowker gives his full approval and support to OPERATION GIANTSTEP as follows: ". . . During conversations I have recently had with Dr. Bernard Donovan . . . we agreed that it is the proper function of the City University to move into this breach at the post high school level. The program you have outlined for OPERATION GIANTSTEP is an element in our total planning to aid this segment of the youth of New York."

6. Dr. Seelig L. Lester, District Superintendent of School District 12 (which includes a portion of the Bronx which contains high schools which may provide applicants for the proposed program). Dr. Lester's comments are especially pertinent since in addition to his experience as an engineer, he was Director of Related Technical Instruction for the Vocational High Schools, Principal of a vocational high school, and Assistant Superintendent in charge of Mathematics and Science Instruction in the high schools of New York City. In a letter dated June 30, 1966 Dr. Lester said after examining a late draft of the proposal:

> 1. . . . your proposal should be effective in meeting two great needs . . . the shortage of sub-professional personnel in industry and the need to have all segments of our population self-supporting and self-respecting.

> 2. Your "vestibule" approach designed to overcome shortcommings in preparation at the high school level is excellent. However, while I endorse the modular approach in an effort to achieve flexibility [to serve diverse needs] . . . I would like to see, if possible, an [even] greater degree of individualization. . . .
>
> In general I think this project is well planned, needed, and could make a vital contribution. . . .

7. Dr. Harry E. Wolfson, Assistant Superintendent, Board of Education, City of New York. Dr. Wolfson's remarks are pertinent since, in addition to being in charge of Instruction and Curriculum Development for the High Schools, he headed the twenty-nine school Vocational High School Division. In a letter dated June 29, 1966 Dr. Wolfson said after examining a late draft of the proposal:

> . . . OPERATION GIANTSTEP [is] . . . particularly worthwhile. . . .
>
> Your proposal is timely in that it recognizes the need for developing in signigficant number of our young people the motivation and the ability to continue their education. As I see it, you seek to rehabilitate, to develop new skills and most important, to inspire young people who 'somehow missed the boat' in earlier programs. In addition, you add another dimension in that you plan to develop occupational competency for those individuals who seek it.
>
> Your project is a curriculum challenge in both secondary school education and post high school education. If it is successful it will be a significant contribution to both fields. . . .

8. Dr. Charles M. Shapp, District Superintendent of School District 10 (includes a portion of the Bronx which contains some of the high schools which may provide applicants for the proposed program since they are closest to Bronx Community College). In a letter dated June 24, 1966 Dr. Shapp said after examining the final draft of the

proposal: ". . . [I hope OPERATION GIANTSTEP] is accepted . . . [because it] offers the prospect of help in the age range where help is critically needed. The overall design is sound and clearly the work of expert and experienced schoolmen. The organization and procedures will unquestionably produce valuable results."

9. Mr. Daniel P. Marshall, Assistant Administrative Director, Office of Superintendent of Schools (Liaison - Vocational High Schools), City of New York, in a letter dated April 6, 1966 said: "I think that [OPERATION GIANTSTEP] is a useful experiment. It seeks to help graduates of general courses from academic high schools who are often left floundering without any adequate vocational preparation and to rehabilitate them at an early stage. . . . ([By using a novel approach]: the vestibule . . . I believe it is being planned along the right lines. . . .)"

The following are a few responses from high schools whose graduates might be served by the proposed project.

10. Dr. Bernard Weiss, Principal, Evander Childs High School, Bronx, N.Y., in a letter dated April 5, 1966 said: "The program would appear to have great merit because it is directed toward a readily identifiable group of students, found largely among the culturally disadvantaged. . . . May such students are beginning to become motivated toward meeting educational prerequisites just about the time they reach the senior year of high school, too late to improve their records [so] as to establish eligibility under existing entrance requirements of the community colleges. . . . We estimate that we should have at least 50 and possibly 100 students who might be eligible for consideration, and this of course does not take into account our recent graduates who are floundering and may turn to us for further guidance." (Evander Childs High School serves lower middle class and integrated neighborhoods).

11. Dr. Paul Schweitzer, Principal, Morris High School, Bronx, N.Y., in a letter dated March 30, 1966 said: ". . . I am very favorably impressed with the goals and purposes of your program. There is agreement also with your recognition that the overwhelming and tremendous problem cannot be solved or even significantly touched unless large numbers of these unemployed youth are reached. . . . The proposed experiment should have value . . . [as] a positive step in the direction of providing practical measures for dealing with the problems evidenced by these young people." (Morris High School serves a significantly deprived area.)

12. Dr. Joshua Segal, Acting Principal, Samuel Gompers Vocational-Technical High School, Bronx, N.Y., in a letter dated March 25, 1966 said: "[The consensus of our administrative, supervisory, and guidance personnel is] that the proposed program has merit, is needed, and can save human resources for our community and country. . . . "We anticipate that approximately eighty students would be likely candidates for OPERATION GIANTSTEP." (Samuel Gompers High School serves a significantly deprived area.)

10-7

The City University of New York
535 East Eightieth Street
New York 21, New York

Office of the Chancellor

May 17, 1965

President Morris Meister
Bronx Community College
120 East 184 Street
Bronx, New York 10468

Dear Dr. Meister:

The plans for Operation Giant Step focus quite sharply on two major issues that face institutes of higher education.

A gap presently exists in the educational flow in the City of New York. Those students who have reasonably successful records in General or Commercial High Schools can move into the two-year college system. However, further occupational education must be provided for those students who have not done well in high school and who do not have employable skills. During conversations I have recently had with Dr. Bernard Donovan, Acting Superintendent of the Board of Education of New York City, we agreed that it is the proper function of the City University to move into this breach at the post high school level. The program you have outlined for Operation Giant Step is an element in our total planning to aid this segment of the youth of New York.

The second notable factor of this program is the degree of articulation between the course of study and the availability of jobs for the graduates. Operation Giant Step has focused on training youth for jobs in the area of industrial technology; a broad field having a number of sub-categories (i.e. draftsman, electronics mechanic, instrument repairman and production planner, etc.) which are included in a U.S. Department of Labor publication, Career Guide for Demand Occupations, which lists seventy-one select occupations needing a continuing supply of workers.

As chief officer of the City University of New York, I give my full approval and support for the request for a grant under Section 4(c) of Public Law 88-210, The Vocational Education Act of 1963.

Sincerely,

Albert H. Bowker
Chancellor

AHB:cdm

SECTION 11: BUDGET

The total funds requested for OPERATION GIANTSTEP are $1,586,680, of which $512,350 represents local contributions (including $129, 100 for equipment). The U.S. Office of Education is requested to supply $1,074,330 (including $243,902 in indirect costs based on the 30.5% rate established for the college by the Department of Health, Education and Welfare).

This budget is organized in accordance with the fiscal period in use by the College (July 1 to June 30). The budget extends over seven years of which the first "year" consists of a six month "tooling-up" period.

Costs for the first and last years of the budget arise entirely from the experimental research program, and consequently federal funds are requested for these periods.

While the entire operation may be viewed as "experimental," federal support is requested only for those costs arising from those portions or aspects of the project which are supplementary to the usual organization of the College, e.g. Project Director, Associate Director, etc., and experimental research costs such as evaluation and data processing. Equipment costs are charged to local funding to conform with U.S. Office of Education instructions, which state that, except under unusual circumstances, federal funds for capital expenditures are not granted.

Costs relating to Vestibule and Control group students are experimental and therefore charged to federal funding. Costs directly related to the Industrial Technology Curriculum are charged to local funds. Those costs that apply to both the Vestibule program and the Industrial Technology Curriculum are pro rated to federal and local support in proportion to the number of students involved.

The budget reflects prevailing rates (for comparable services, supplies, equipment, or space rental) in the New York City area in which the College will operate this program.

Tables IX and X on the following two pages give the details of the budget.

TABLE IX

OPERATION GIANTSTEP BUDGET SUMMARY

Fiscal Period	Federal Cost	Local Cost	Total Cost
9/66-8/67	$ 70,560	---	$ 70,560
9/67-8/68	257,490	$146,290	403,780
9/68-8/69	348,620	104,260	452,880
9/69-8/70	214,490	200,200	414,690
9/70-8/71	120,270	61,600	181,870
9/71-8/72	62,900	---	62,900
Project Cost	$1,074,330	$512,350	$1,586,680